
Europe's Rail
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EUROPE'S RAIL
GENERAL ASSEMBLY
ONLINE
03
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2025
@EURail_JU
Europe's Rail Joint Undertaking

Agenda – Day 2

09.00 – 09.15	**Opening Words by the Director for Land Transport of DG MOVE**
09.15 – 09.25	**Looking Forward, the European Rail Need for Simplification**
09:25 – 09:45	**Advisory Bodies Activities** • Scientific Steering Group • States' Representatives Group
09.45 – 10.55	**Implementation of the EU-Rail Programme** • Innovation Pillar: State of Play and Year 3 Results • Q&A
10.55 – 11.10	*Coffee Break*
11.10-12.20	**Implementation of the EU-Rail Programme** • System Pillar: State of Play and Year 3 Results • Preparing Deployments: Deployment Group and EDDP • Q&A
12.20 – 12.30	**Closing Words by the EU-Rail Executive Director**

Opening Words by the Director for Land Transport General of DG MOVE

Kristian Schmidt

Looking forward, the European rail need for simplification

Giorgio Travaini

Why looking forward together?

🎯 CRITICAL RAIL CHALLENGES

- *System Fragmentation and system costs*: Diverse national standards hinder harmonization - only European approach delivers cost-effective improvements
- *Investment Constraints*: Insufficient public/private investment limits modernisation, especially digital transformation
- *Competitiveness pressure*: not capitalising on a single market with standardised accepted solution, already today advantages non-European competitors
- *Resilience Issues*: Climate change, cybersecurity demand coordinated response

🚀 SYSTEM COMPLEXITY DEMANDS EU COORDINATION

- Structural and functional subsystems + Interconnected components with lifecycles up to 40 years (trains) and 100 years (infrastructure)
- Cross-border operations requiring harmonised implementation
- Multi-year migration plans across national boundaries
- Meeting ambitious EU greening, digitalisation and competitiveness targets

→ **This exceeds any market initiative from single or limited players**

Future Directions: System Simplification Mission

- *Mission*: that centres on **simplifying the rail systems and operations while enhancing its fundamental capabilities and reducing its costs.** Aiming to strengthen the Single Market and deliver a harmonised Single European Rail Area (SERA)
- *Critical challenges*: fragmentation, funding, competitiveness, resilience
- *Enhanced PPP framework building on EU-Rail foundation*:
  - Expanded scope including pre-deployment activities
  - Coordinate pre-deployment to bridge innovation to market impact
  - Greater inclusiveness

→Focus on **Agility**, **Resilience**, and **Competitiveness**

→This would require an ambitious common investment by both private and public entities under the next EU Multi-Annual Financial Framework (2028-2034)

An ambitious common investment

€3 billion in R&I innovation addressing the need for costly yet essential one-time developments of innovative solutions aiming to transition the diverse existing legacy systems into a new, simplified European rail system.

€15 billion in pre-deployment from the participation of diverse stakeholders across different countries to upgrade their systems and make investments in their network. Procurement activities to enable a first implementation at system level.

To deliver for passengers and businesses:

Service Quality + Cost-Effectiveness + System Resilience + Standardisation

FI1: European Simplified and Integrated Railway System

FI2: The Next-Generation Rail Freight Operations with European Digital solutions

FI3: Resilient and Recoverable Railway System

FI4: Innovative EU High-Speed Rail Corridors

Advisory Bodies Activities

Scientific Steering Group

Juan de Dios SANZ

Vice-chair

LEGAL FRAMEWORK UNDER HORIZON EUROPE

The Scientific Steering Committee (SSG) is part of EU-Rail's Governance based on the Single Basic Act (SBA) *(1).*

Article 21 defines the terms and the actions for the provision of Scientific Advice:

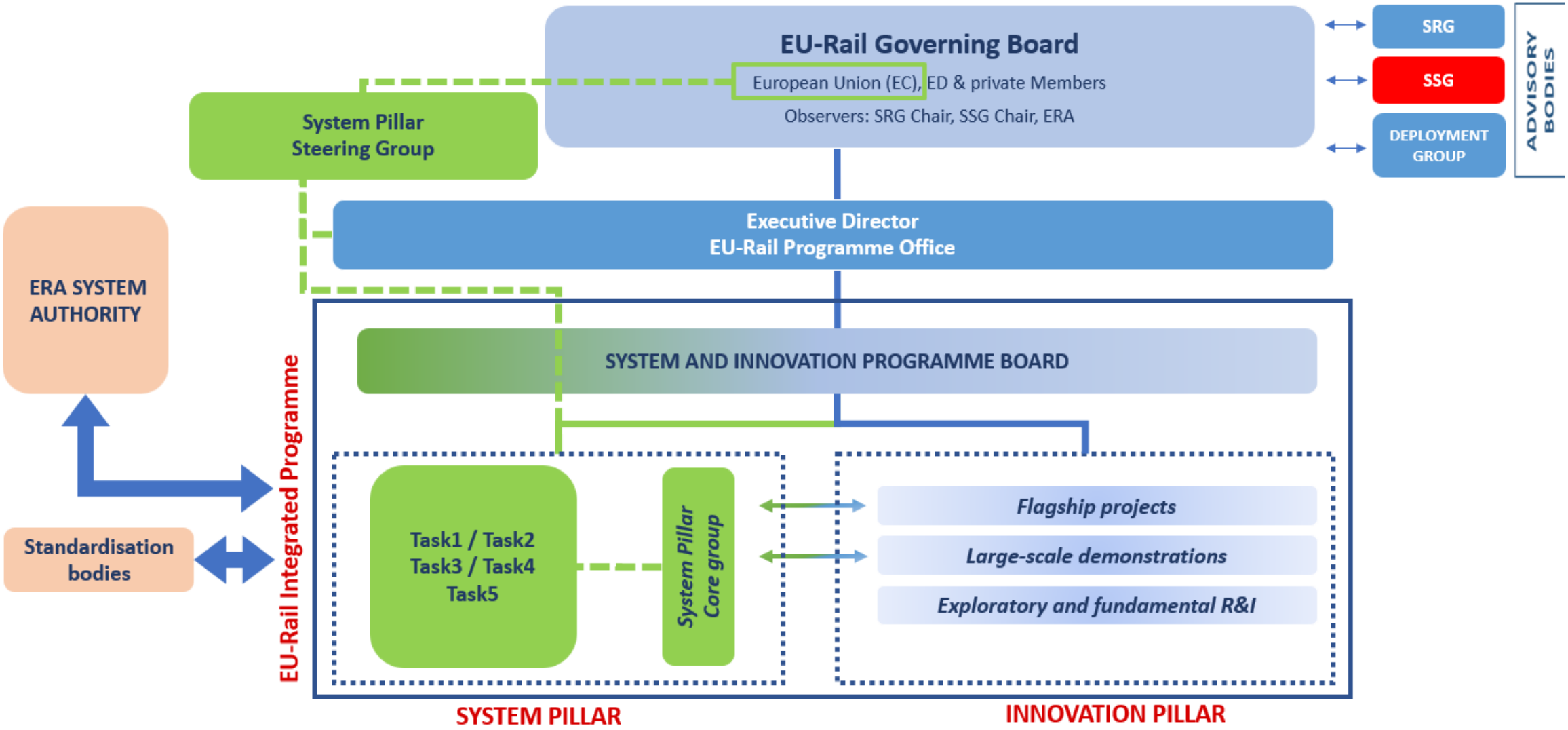
- **Independent** scientific advice
- Two possible actions: as an advisory body or via "ad hoc" requests for independent expertise by the Governing Board

The tasks of the SSG shall carry out the following **tasks**, according to Article 21.7:

- advise on the scientific priorities of EU-Rail's Work Programmes, including scope of calls for proposals
- advise on the scientific achievements to be describe in the Annual Activity Report
- suggest corrective measures, if necessary
- provide independent advice on specific issues as requested by the Governing Board (e.g. as regards potential
  associated members and contributing partners)
- evaluate results of funded projects
- etc.

(1) Council Regulation (EU) n°2021/2085 of 19 November 2021, establishing the Joint Undertakings under Horizon Europe, including the Europe's Rail Joint Undertaking

SSG IN EU-RAIL GOVERNANCE



COMPOSITION AND ORGANISATION OF THE SSG

Selection process:

- Call for Expressions of Interest launched on 15 March 2023 and closed on 30 June 2023
- Selection finalised on 19 October 2023 with a final decision by EU-Rail's Governing Board

12 Members: *Angela di Febbraro (Chair), Juan de Dios Sanz (Vice-chair), Nacima Baron, Michele Carboni, Mathijs De Weerdt, Alessandro Fantechi, Luis Ferreira, Matthias Landgraf, Martin Leitner, Klaus Moessner, Ladislav Routil, Mariëlle Stoelinga*

- The SSG Members reflect a balanced representation of world-renowned scientists and engineers from academia, industry, SMEs, non-governmental organisations and regulatory bodies, and having the necessary scientific competencies and expertise covering the technical domain of EU-Rail JU.
- The SSG Members are bound by confidentiality and non-conflict of interest rules in relation to their work at the SSG (e.g., preparation of proposals to EU-Rail's call for proposals or evaluation of proposals).

2 Observers: *Claude Marin-Lamellet (ECTRI), Jan Andersson (ETRA)*

2025 ACTIVITIES OF THE SSG

In 2025, the SSG provided scientific advice to the EU-Rail Executive Director and Governing Board on the following topics:

- ✓ Amendments n° 1 and n°2 of Work Programme 2025-2026
- ✓ Revised Multi-Annual Work Programme
- ✓ Consolidated Annual Activity Report for 2024
- ✓ High-level Paper on “A future policy based public private partnership for rail”
- ✓ Work Programme 2026
- ✓ Annex to High-level Paper on Flagships

Some SSG Members will contribute to the assessment of the work of EU-Rail’s Flagship projects.

Information on the SSG and activity can be found on EU-Rail’s website:

https://rail-research.europa.eu/about-europes-rail/europes-rail-structure-of-governance/scientific-steering-group/

Advisory Bodies Activities

States' Representatives Group

Miroslav Haltuf

Chair of the SRG

SRG activities in 2025

Dedicated SRG meeting
February 18, 2025

- The SRG discussed on the future policy based public private partnership for rail and FP10.
- A series of meetings with Permanent Representations in Brussels was organised (with Research attaché, EU-Rail ED and interested SRG Members).
- Members were also encouraged to establish contact with their national MEPs.
- There was also a first discussion on the draft WP 2026.

11th SRG meeting
February 19, 2025

- There was an update of EC activities and ED report on EU-Rail's on-going activities.
- The SRG discussed on the options for its request for a transport policy study.
- There was a detailed presentation and exchange of views on FP5 and EDDP activities.
- There was a detailed presentation and exchange of views on EGNOS application to rail and EU-Rail cooperation with EUSPA and ESA.

SRG activities in 2025

12th SRG meeting
May14, 2025

- The ED provided a report of EU-Rail's on-going activities.
- The ED presented the Regional Matchmaking Days programme, aimed at encouraging further geographical representation with new participants in future calls for proposals.
- The Chair of the SRG was re-elected, Mr Miroslav Haltuf (CZ), for another period of 2 years.
- The SRG Members provided a positive opinion on:
  - draft Consolidated Annual Activity Report of 2024
  - draft amendment n° 1 of the WP 2025-2026
  - draft revised Multi-Annual Work Programme
  - Draft High-level paper on a future policy based public private partnership for rail

Dedicated SRG meeting
October 21, 2025 –
SRG Members only

The SRG Members discussed about the future of EU-Rail JU, which included:

- draft Annex to the High-level paper on the future of rail
- the involvement of States in future activities and in particular pre-deployment
- Fostering implementation of innovation into the market (including coordination with ERA)
- Conclusions of survey on the improvement of the SRG working process

SRG activities in 2025

13th SRG meeting
October 22, 2025

- The SRG welcomed new representatives from Austria and Israel.
- The EC provided an update on main EU policy activities.
- The ED updated Members on the main developments of EU-Rail's on-going activities.
- Some members expressed their concern on the need to attract new participants in EU-Rail's calls for proposals, new innovators from businesses and academia to improve quality of projects.
- The ED presented the Regional Matchmaking Days programme, aimed at encouraging further geographical representation with new participants in future calls for proposals.
- A new SRG Vice-Chair was elected: Ms Johannna Nes (NL)
- The SRG Members provided a positive opinion on:
  - draft amendment n° 2 of the WP 2025-2026
  - Draft AWP 2026
  - draft Annex to High-level paper on the future of rail
- There was a presentation and exchange of views with the ED of ERA to strengthen collaboration.

SRG at WCRR
November 19, 2025

- The SRG chair presented the paper *"Strategies in rail research from the Europe's Rail SRG View".*
- Presentation available
- The SRG Chair discussed on the potential cooperation with research authorities in the United States, Canada, Australia, South Africa and Korea.

ACTIVITY PER COUNTRY - 2025

SRG reporting on national R&I activities 2025

- The joint undertakings shall organise continuous monitoring and reporting on information on synergies between the EU-Rail JU actions and national or regional initiatives and policies based on information received by the SRG, as well as on synergies with other Union programmes and other European partnerships (Art. 171.2 (b) of the Single Basic Act).
- This information is received every year in the following form (*"Country fiches"*):
  - **General** information containing the Country policy, Strategy, and dedicated Programmes with calls for proposals
  - **Specific** information containing the Country priority area including possible national/regional supported actions with potential synergies with ongoing EU-Rail projects
- All lists of R&I rail activities per country are available on the SRG page of EU-Rail's website.
- A series of synergy actions on the reported activities are proposed by EU-Rail and its project coordinators and shared with the SRG Members for follow-up
- In 2025, 6 countries provided updates of their R&I lists: *Austria, Czech Republic, Germany, Norway, Portugal, Slovakia* > *already available on EU-Rail's website*
- More updates are welcome, and countries not having submitted yet their lists are encouraged to do it !
- A consolidated 2025 Report will soon be available on the SRG page of EU-Rail's website (in line with Art. 20(10) of the Single Basic Act).

UPDATED REPORT ON NATIONAL R&I ACTIVITIES

Around 30 programmes have been identified by the Member States, of which the following are open for call for submission, or will be in the upcoming months

•**WBIF – Investment Grants and Technical Assistance.** Calls published twice per year. https://www.wbif.eu/investment-grants https://www.wbif.eu/technical-assistance-grants

•**Rail4Climate: Digitalization and automatization of the rail system.** 2024-2027. First call 23/10/2024-12/03/2025 (evaluation decision expected in June 2025). Calls on a yearly basis. Budget: 5M/year. https://www.ffg.at/dtm_meta-train_call2024

•**DOPRAVA 2030** (successor of DOPRAVA 2020+): Modernizing the transport sector regarding sustainability, safety and societal needs (2023-2030). https://www.tacr.cz/program/doprava-2030/

•**FoPS:** Finances scientific research projects that contain model solutions for typical transports problems in cities and municipalities that are transferable nationwide as far as possible. Calls on a yearly basis. https://fops.de/

•**Subsidy program for companies to support sustainable and digital transport** (Spanish Ministry of Transport): Subsidies to companies to support sustainable and digital transport in competitive competition, within the framework of the Recovery, Transformation and Resilience Plan (PRTR) (2022-2025). Total budget: 800M. https://www.transportes.gob.es/ministerio/proyectos-singulares/prtr/programa-de-subvenciones-empresas-para-el-apoyo-de-un-transporte-sostenible-y-digital

•**PT 2030 Programme** (Structural funds – ERDF): R&I collaborative calls are foreseen for all subjects.

•**InfraSweden**: Strategic innovation program for a smart, sustainable, resilient and competitive transport infrastructure. One call per year until 2027. https://www.infrasweden.nu/

•**Albania: Economic Reform Programme (ERP) 2023 – 2025:** Technical assistance for preparation of national ITS strategy for Albania (railway and maritime) and other regional partners in the Western Balkan.

- **UK RSBB cross-industry research programme**: The aim is to enable a safe and efficient railway by providing knowledge and solutions to best utilize existing assets and unlock future change. The core funding for the programme is provided by a grant from the Department for Transport (DfT) which is currently around €10m per year. This is run as a three-way partnership involving DfT, RSSB and industry. In addition, industry provides some cash co-funding, significant in-kind support and lead on using the outputs so that they deliver benefits

Around 30 programmes have been identified by the Member States, of which the following are open for call for submission, or will be in the upcoming months

NB: These programmes have been made known to EU-RAIL in November 2025. No information about ongoing or planned calls EU-RAIL received.

TREND – ongoing programme

- ***Rail strategy „Agenda für zufriedene Kunden auf der Schiene****" 1 ("Agenda for satisfied rail passengers") focuses on the reliability of rail services for rail passengers (including improving safety at stations, improved comfort), digitalization (esp. ETCS infrastructure, vehicles), FRMCS and the acceleration of planning and approval procedures.*
- ***Federal Research Programme of Rail Transport****(2022): Targets and priorities for rail research in the medium term.*
- ***Mobilitätswende (Mobility Transition) programme****: drives the transition to a climate-neutral mobility system by 2040, promoting traffic reduction, modal shift, and sustainable transport technologies— including rail and digital innovations. Through interdisciplinary projects and real-world testing, it accelerates the development and implementation of transformative mobility solutions, while positioning Austria as a leader in sustainable transport within Europe*

Roughly 90 projects have been identified by the Member States, of which several synergies are expected by the SRG members, here below few examples that will be further enlarged during the course of 2026, with a specific action plan: With EU-Rail FP1:

NB: the synergies proposed with EU-RAIL FPs should be confirmed with the FPs.

- ✓ **FW03010571: AI system for multimodal traffic data evaluation**
  - Synergies to be considered with FP1, FP2 and FP5.

- ✓ **2023-05-D[1]1217:** Framework conditions, processes and planning tools for capacity-optimized building and maintenance activities in the existing rail network:
  - Synergies to be considered with FP1 and FP3.

- ✓ **Energy-efficient coordination and control of rail traffic in real time – EKSSE:** The primary focus is on the optimal utilization of degrees of freedom in real-time rail traffic operations, i.e., during ongoing operations. The project develops a mixed-integer program that determines the most energy-efficient permissible timetable.
  - Synergies to be considered with FP1 and FP2. [Synergy under assessment / to be confirmed]
- ✓ **Development of a data space in the international railway industry using cloud-edge technology for data collection and processing (Railway-X)**
  - Synergies to be considered with FP1. [Synergy under assessment / to be confirmed]

- ✓ **CL02000146 Sustainable Concept of Railway Capacity Allocation:** The aim is to develop an original methodology for efficient multi-year planning of rail capacity on mainlines with mixed traffic.
  - Synergies to be considered with FP1. [Synergy under assessment / to be confirmed]

Roughly 90 projects have been identified by the Member States, of which several synergies are expected by the SRG members, here below few examples that will be further enlarged during the course of 2026, with a specific action plan: With EU-Rail FP2:

NB: the synergies proposed with EU-RAIL FPs should be confirmed with the FPs.

- ✓ **ERTMS ASAP for the implementation of a new European train safety system (until 2050)**
  - Links to be established with FP2 to align where possible and exchange.
- ✓ **CK04000088: Increasing of tunnel safety using continuous accurate vehicle location (2023-2025).**
  - No JU Members involved.
  - To be seen whether this can be of use for FA2 – ASTP project or not. Not specifically mentioned that work will be focused on improving onboard localization as such or whether we are dealing with a mix of different technologies – including detection on the trackside.
  - Ongoing Action: following a check with the FP, organise a dedicated meeting between projects to see whether there are synergies or not.
- ✓ **FW08010072: Wagon 5G communication unit (2023-2025).**
  - Links to be established with FP2 to align where possible and exchange.
- ✓ **CK04000082: Advanced cyber security methods in tunnel systems as a part of critical transport infrastructure (2023-2025).**
  - No JU Members involved.
  - To be seen whether this can be of use for FA2 or SP (cybersecurity). This project focuses on Tunnel safety/security.
  - Ongoing Action: following a check with the FP, organise a dedicated meeting between projects to see whether there are synergies or not.

Roughly 90 projects have been identified by the Member States, of which several synergies are expected by the SRG members, here below few examples that will be further enlarged during the course of 2026, with a specific action plan: With EU-Rail FP2:

NB: the synergies proposed with EU-RAIL FPs should be confirmed with the FPs.

- ✓ **TARO ("Towards Automated Railway Operation"): Automatization & Digitalization for the Railway System.**
  - EU-Rail already part of the advisory group and OEBB ensuring transfer of knowledge through IKAA.

- ✓ **Rail4Climate (R4C):** digitalization and automatization of operations, maintenance, infrastructure, and rolling stock; reduction of the time-to-market; substantial contribution to climate neutrality of the mobility system.
  - Synergies to be considered with FP2 and FP4.

- ✓ **FW03010571: AI system for multimodal traffic data evaluation**
  - Synergies to be considered with FP1, FP2 and FP5.

- ✓ **2022-21-D[1]1202**: Teleoperation as a complement for automatic train operation (ATO): Framework and human[1] centered design.
  - Synergies to be considered with FP2.

- ✓ **2022-20-D[1]1202**: Further Development of the Open Data Foundations for Object Detection and Classification by Means of Artificial Intelligence in Automatic Train Operation.
  - Synergies to be considered with FP2.

- ✓ **2022-19-S[1]1202**: Stakeholder expectations and societal acceptance conditions in automated rail transport in GoA3+.
  - Synergies to be considered with FP2.

Roughly 90 projects have been identified by the Member States, of which several synergies are expected by the SRG members, here below few examples that will be further enlarged during the course of 2026, with a specific action plan: <u>With EU-Rail FP2:</u>

NB: the synergies proposed with EU-RAIL FPs should be confirmed with the FPs.

- ✓ **2020-20-D[1]1202**: ATO: Functional requirements of sensors and logic module.
  - Synergies to be considered with FP2.

- ✓ **GINT-Gigabit Innovation Track:** GINT is creating the technological and organizational foundations for gigabit coverage along railway tracks.
  - Synergies to be considered with FP2 – *under assessment*.

- ✓ **Energy-efficient coordination and control of rail traffic in real time – EKSSE:** The primary focus is on the optimal utilization of degrees of freedom in real-time rail traffic operations, i.e., during ongoing operations. The project develops a mixed-integer program that determines the most energy-efficient permissible timetable.
  - Synergies to be considered with FP1 and FP2 [Synergy under assessment / to be confirmed]

- ✓ **Automated Train:** The Automated Train project aims to develop and demonstrate key technological solutions for implementing fully automated train operation on main and branch lines (so-called ATO GoA4) in a collaborative project involving industry, railway companies, infrastructure operators, and research institutions.
  - Synergies to be considered with FP2 [Synergy under assessment / to be confirmed]

Roughly 90 projects have been identified by the Member States, of which several synergies are expected by the SRG members, here below few examples that will be further enlarged during the course of 2026, with a specific action plan: With EU-Rail FP3:

NB: the synergies proposed with EU-RAIL FPs should be confirmed with the FPs.

- ✓ **CK04000082: Advanced cyber security methods in tunnel systems as a part of critical transport infrastructure (2023-2025).**
  - Links to be established with FP3 to align where possible and exchange.
- ✓ **CK03000182: Research of construction-technical requirements for the use of TEN-T ground infrastructure to solve large-scale crisis situations (2022-2025).**
  - Links to be established with FP3 to align where possible and exchange.
- ✓ **CK04000109: Predictive diagnostics of ITS technological equipment using IA approaches (2023-2025).**
  - Links to be established with FP3 to align where possible and exchange.
- ✓ **FW06010422: Simulation and design of structures from digital concrete (2023-2025)**
  - Links to be established with FP3 to align where possible and exchange.
- ✓ **CK03000168: Intelligent methods of digital data acquisition and analysis for bridge inspections.**
  - Links to be established with FP3 to align where possible and exchange.
- ✓ **CL01000137: Modular Traction Converter for Substations and Flexible AC Transmission System (FACTS)**
  - Links to be established with FP3 to align where possible and exchange.

Roughly 90 projects have been identified by the Member States, of which several synergies are expected by the SRG members, here below few examples that will be further enlarged during the course of 2026, with a specific action plan: With EU-Rail FP3:

NB: the synergies proposed with EU-RAIL FPs should be confirmed with the FPs.

- ✓ **Several projects from DZSF (various TRL)**: synergies foreseen with FP3 and FP4.
  - Ongoing Action: following a check with the FP, organise dedicated meetings between projects.

- ✓ **2023-05-D[1]1217:** Framework conditions, processes and planning tools for capacity-optimized building and maintenance activities in the existing rail network:
  - Synergies to be considered with FP1 and FP3.

- ✓ **Management and Extension of Service Life of infrastructures affected by Alkali-silica reaction (MESLA):** The overall aim is to build up new knowledge on how to manage and maintain existing ASR-affected structures in a technical, economic and environmental beneficial way, and verify how this knowledge can be applied to ensure structural safety and extend the service life of existing bridges.

- ✓ **Sound TRAnsport NETworks (S-TRANET):** The aim is to establish the cause of hazard events on railway infrastructure using a distributed sensor network (2023-2027)

- ✓ **Railway Construction Innovation:** The aim is to deliver demonstrations of innovation in railway construction working with the teams building the Global Centre of Rail Excellence (GCRE) facility. The current budget is approximately EUR 8M for 2022-2025 (2025 tbc).

- ✓ **AutoKontroll - Automatisert kontroll av jernbane**: The AutoKontroll project aims to develop fully automated and semi-automated solutions to perform some of these inspections. This is intended to be done by automatic analysis of images of infrastructure taken from train-mounted cameras. [*Synergy under assessment / to be confirmed]*

Roughly 90 projects have been identified by the Member States, of which several synergies are expected by the SRG members, here below few examples that will be further enlarged during the course of 2026, with a specific action plan: With EU-Rail FP3:

NB: the synergies proposed with EU-RAIL FPs should be confirmed with the FPs.

- ✓ **Safety assessment of infrastructure structures using digital technologies – Take-off for practical application (AISTEC-PRO):** Sensor- and image-based monitoring technologies, such as high-resolution cameras carried by drones, enable the systematic collection, analysis, storage, and visualization of condition data for the safety assessment of structures. [*Synergy under assessment / to be confirmed]*

- ✓ **DigiOnTrack** - Increasing the future viability of local rail passenger transport through sensors, artificial intelligence and shared data use. The project aims to verify the effectiveness and applicability of structure-borne sound measurement methods for covering a range of monitoring and maintenance inspections on railways and vehicles. [*Synergy under assessment / to be confirmed]*

- ✓ **AIFRI** - Artificial Intelligence For Rail Inspection. Investigating whether AI can be successfully used for condition-based maintenance of rail infrastructure. [*Synergy under assessment / to be confirmed]*

- ✓ **CL02000125: Advanced Diagnostics of Railway Turnout Movable Parts:** The aim of the project is therefore to develop an autonomous device for comprehensive diagnostics of movable parts. The autonomous diagnostic system will be installed in the crossing area and applied to switch area and will diagnose the operational condition. [*Synergy under assessment / to be confirmed]*

Roughly 90 projects have been identified by the Member States, of which several synergies are expected by the SRG members, here below few examples that will be further enlarged during the course of 2026, with a specific action plan: With EU-Rail FP4:

NB: the synergies proposed with EU-RAIL FPs should be confirmed with the FPs.

- ✓ **CK04000107: Research and development of advanced composite cylinders for alternative fuels (2023-2025).**
  - Links to be established with FP4 to align where possible and exchange.

- ✓ **Rail4Climate (R4C):** digitalization and automatization of operations, maintenance, infrastructure, and rolling stock; reduction of the time-to-market; substantial contribution to climate neutrality of the mobility system.
  - Synergies to be considered with FP2 and FP4.

- ✓ **CK02000218: Wayside diagnostic of railway vehicles running gear**
  - Links to be established with FP4 to align where possible and exchange.

- ✓ **CK02000044: Progressive development of hydrogen economy in transport in the Czech Republic**
  - Links to be established with FP4 to align where possible and exchange.

- ✓ **CL01000041: Means for the implementation of low-emission technologies in rail transport**
  - Links to be established with FP4 to align where possible and exchange.

- ✓ **Several projects from DZSF (various TRL)**: synergies foreseen with FP3 and FP4.
  - Ongoing Action: following a check with the FP, organise dedicated meetings between projects.

Roughly 90 projects have been identified by the Member States, of which several synergies are expected by the SRG members, here below few examples that will be further enlarged during the course of 2026, with a specific action plan: With EU-Rail FP4:

NB: the synergies proposed with EU-RAIL FPs should be confirmed with the FPs.

- ✓ **ADIF R&I Programme.** Mainly dedicated to the following projects: Platforms (TRL 8), Hydrogen fuel cell train. (TRL 7) and Broken rail. (TRL 7).
  - Possible synergies to be considered with FA3 and FA4.
  - Ongoing Action: following a check with the FPs, organize a dedicated meeting between projects.

- ✓ **Program Source Approach to Rail Vibrations.** English: Innovation Agenda for Minimizing Track Vibrations at the Source.
  - Synergies to be considered with FA4 activities.
  - Ongoing Action: following a check with the FP, organize a dedicated meeting between projects.

- ✓ **Resilient Rail:** Operational safety questions for increased resilience in rail.

- ✓ **3D scanning and reverse engineering algorithms in the railway sector:** The project goal is to establish a reverse engineering workflow from physical parts to well behaved CAD models facilitating rapid manufacturing of replacement parts as well as a library of digital replica and tools for training personnel and efficient maintenance of components.

- ✓ **Digital Approval of 3D-printed components for rail vehicles – DIGIZUG.** [*Synergy under assessment / to be confirmed]*

- ✓ **Modular scalable energy storage system for sustainable local rail passenger transport - MOSENAS.** The project aims to develop a battery-electric train for long-term use on various non-electrified and partially electrified railway lines. The project focuses on designing a modularly scalable battery storage system, taking into account operational suitability, economic viability, and compatibility with the surrounding charging infrastructure. [*Synergy under assessment / to be confirmed]*

- ✓ **CL01000137: Modular Traction Converter for Substations and Flexible AC Transmission System (FACTS):** The project aims to develop power semiconductor for 25 kV/50 Hz railway traction power substations (TPSSs) designed to be fitted into a container, and to manufacture a functional prototype of such device. [*Synergy under assessment / to be confirmed]*

Roughly 90 projects have been identified by the Member States, of which several synergies are expected by the SRG members, here below few examples that will be further enlarged during the course of 2026, with a specific action plan: With EU-Rail FP5:

NB: the synergies proposed with EU-RAIL FPs should be confirmed with the FPs.

- ✓ **CK04000041: SmartRail – Automated data analysis related to rail freight traffic (2023-2025).**
  - Links to be established with FP5 to align where possible and exchange.

- ✓ **CL01000180: Use of Artificial Intelligence in Support of Dispatcher Control of Rail Freight Transport**
  - Links to be established with FP5 to align where possible and exchange.

- ✓ **SCOPE Project for shared freight transport services connecting shipper and carrier operations (forwarding and carriers)** (from European regional Development Fund Interreg Balkan MED (Balkan Mediterranean)).
  - Links to be established with FP5 and possible expression of interest for DAC pre-deployment trains.

- ✓ **FW03010571: AI system for multimodal traffic data evaluation**
  - Synergies to be considered with FP1, FP2 and FP5.

- ✓ **Operating regime of overhead contact line-less traction in rail freight transport (Project number 2022-10-W-1202 - Ongoing)**
  - Links to be established with FA5 to align where possible and exchange.
  - Ongoing Action: following a check with the FP, organise a dedicated meeting between projects.

Roughly 90 projects have been identified by the Member States, of which several synergies are expected by the SRG members, here below few examples that will be further enlarged during the course of 2026, with a specific action plan: With EU-Rail FP5:

NB: the synergies proposed with EU-RAIL FPs should be confirmed with the FPs.

- ✓ **Determination and optimisation of influences in rail passenger transport and rail freight transport on the capacity of the overall rail system (Project number 2022-04-D-1202 - Ongoing)**
  - Links to be established with FA5/FA6 and ESEP4Freight to align where possible and exchange.
  - Ongoing Action: following a check with the FP, to possibly organize a dedicated meeting between projects.

- ✓ **Digital Automatic Coupling – Demonstrator (Project number 2020-E12-1202 - Ongoing)**
  - Links to be established with FA5 to align where possible and exchange.
  - Ongoing Action: following a check with the FP, organize a dedicated meeting between projects.

- ✓ **ELETA Project for Enhanced Data Interoperability for Combined Transport (EDICT)** for the period up to and including 2024.
  - Links to be established with FA5 to align where possible and exchange.
  - Ongoing Action: following a check with the FP, organize a dedicated meeting between projects (and with ESEP4Freight).

- ✓ **Pilot automation container-transport shuttles (INDIGO+):** Pilot to automated train preparation and breaking process (automatic brake testing, automatic wagon inspection, digital automatic coupling (DAC)).
  - Links to be established with FA5 to align where possible and exchange.
  - Ongoing Action: following a check with the FP, organize a dedicated meeting between projects.

Roughly 90 projects have been identified by the Member States, of which several synergies are expected by the SRG members, here below few examples that will be further enlarged during the course of 2026, with a specific action plan: With EU-Rail FP5:

NB: the synergies proposed with EU-RAIL FPs should be confirmed with the FPs.

- ✓ **Sensoring Better use of Last Mile:** The aim of the pilots is to increase the planned capacity at rail yards by 25%, thereby achieving better use of the existing rail infrastructure. The financial coverage of the pilots is provided by the Ministry of I&W and different port authorities.
  - Links to be established with FA5 to align where possible and exchange.
  - Ongoing Action: following a check with the FP, organize a dedicated meeting between projects.

- ✓ **Subsidy scheme for modal shift from road to rail and inland shipping. The scheme has been approved by the European Commission and has a duration of four years and includes €7.5 million for rail.**
  - Links to be established with FA5 and FA6 to align where possible and exchange.
  - Ongoing Action: following a check with the FP, organize a dedicated meeting between projects.

- ✓ **Zefes (Zero-Emission Long-Haul Freight Transport):** 3,5-year project aiming to deploy 9 different long-haul truck configurations (BEV and FCEV) in various use cases covering important TEN-T corridors in Europe. The project addresses the decarbonization of long-distance freight transport by demonstrating real-world applications with battery electric vehicles (BEVs) and fuel cell electric vehicles (FCEVs) across Europe.

- ✓ **Optimizing Yard Operations**: OYO will develop artificial intelligence algorithms based on mathematical optimization. OYO's algorithms will address key challenges such as allocating parking slots and determining how trains should move within the yards. [*Synergy under assessment / to be confirmed]*

- ✓ **Development of a showcase platform for the free display of standardized timetables for combined transport – EiFaS**: The aim is to facilitate the exchange of information on intermodal connections between stakeholders and customers. [Synergy under assessment / to be confirmed]

- ✓ **DAC4EU**: DAC4EU" is testing DAK prototypes from various manufacturers.

Roughly 90 projects have been identified by the Member States, of which several synergies are expected by the SRG members, here below few examples that will be further enlarged during the course of 2026, with a specific action plan: With EU-Rail FP6:

NB: the synergies proposed with EU-RAIL FPs should be confirmed with the FPs.

- ✓ **Reactivation of railway lines in border regions (Project number 2022-23-U-1202 - Ongoing)**
  - Links to be established with FA6 to align where possible and exchange.
  - Ongoing Action: following a check with the FP, organise a dedicated meeting between projects.

- ✓ **Determination and optimisation of influences in rail passenger transport and rail freight transport on the capacity of the overall rail system (Project number 2022-04-D-1202 - Ongoing)**
  - Links to be established with FA5/FA6 and ESEP4Freight to align where possible and exchange.
  - Ongoing Action: following a check with the FP, to possibly organize a dedicated meeting between projects.

- ✓ **ADIF R&I Programme with referred activity for low cost ERTMS (TRL 7)**
  - Ongoing Action: to strengthen the links with FP6 to align where possible and exchange.

- ✓ **MaaS Mobility as a Service / MaaS apps developed / MaaS cross-border planning**
  - Links to be established with FA6 to align where possible and exchange.
  - Ongoing Action: following a check with the FP, organize a dedicated meeting between projects.

- ✓ **Subsidy scheme for modal shift from road to rail and inland shipping. The scheme has been approved by the European Commission and has a duration of four years and includes €7.5 million for rail.**
  - Links to be established with FA5 and FA6 to align where possible and exchange.
  - Ongoing Action: following a check with the FP, organize a dedicated meeting between projects.

Roughly 90 projects have been identified by the Member States, of which several synergies are expected by the SRG members, here below few examples that will be further enlarged during the course of 2026, with a specific action plan: Potential links with several FPs:

NB: the synergies proposed with EU-RAIL FPs should be confirmed with the FPs.

- ✓ **CORIFER 2023:** Contribute to the in-depth transformation of the railway sector and the corresponding mobility system, by responding to technological, competitiveness and ecological transition challenges. *(Theme 1 - Train with very low environmental impact; Theme 2 – Efficient and inclusive daily mobility; Theme 3 – Digitalization of rail transport: vehicle, infrastructure and industry; and Theme 4 – Acceleration of rail freight)*
  - Impact on MAWP – links to be established.
- ✓ To follow up the Pilot-T scheme, smart mobility solutions by developing and testing and/or piloting technologies, services and business models with the potential to influence the transport system of the future to make it efficient, safe and environmentally friendly.
  - Ongoing Action: following a check with the FPs, organize dedicated meetings between projects
- ✓ **Norwegian Transport 2025 programme**: Generate knowledge and solutions for use in the development of an integrated, future-oriented transport system that will meet the needs of trade and industry and society at large for effective, sustainable transport.
- ✓ **Projects funded by BRIK II Programme** (Research and Development in Railway Infrastructure).
- ✓ **Smart logistics considered in their National Plan 2030 with instruments to finance pilots and demonstrations**
  - Ongoing Action: following a check with all FPs, organize dedicated meetings between projects, considering the National Plan provided as reference.

Roughly 90 projects have been identified by the Member States, of which several synergies are expected by the SRG members, here below few examples that will be further enlarged during the course of 2026, with a specific action plan: Potential links with several FPs:

NB: the synergies proposed with EU-RAIL FPs should be confirmed with the FPs.

- ✓ **Smart logistics considered in their National Plan 2030 with instruments to finance pilots and demonstrations**
  - Ongoing Action: following a check with all FPs, organize dedicated meetings between projects, considering the National Plan provided as reference.
- ✓ **Infrasweden is a strategic innovation program that has one call per year with different focuses within sustainable transport infrastructure (**https://www.infrasweden.nu/**)**
  - Ongoing Action: following a check with all FPs, organize dedicated meetings between projects as synergies with FPs could be explored.
- ✓ **Component 9 of the Renewal Plan** – More effective management and strengthening of funding for research, development and innovation.
- ✓ **First of a Kind Programme:** The aim is to reduce costs and risks for the rail industry associated with implementing new technologies. It supports rail innovation through the demonstration of an innovation on the live railway. There are new competitions annually with approximately EUR 7.5M allocated to new projects as a result.
- ✓ **Control Period (CP) 7 Research and Development Programme:** It refers to the next five-year planning and funding cycle for Network Rail in Great Britain, covering the period from 1 April 2024 to 31 March 2029. The plans include investment in technology and research and development.

(SRG CHAIR) EXCERPT FROM THE SRG REPORTS ON NATIONAL R&I ACTIVITIES AND THEIR POTENTIAL SYNERGIES WITH EU-RAIL PROGRAMME

December 2025

Status of reporting as per November 20, 2024

** LU informed that no changes*
***NL will soon provide an update*

status of reporting as per November 30, 2025

Number of Member States in the SRG - 2024 : **32**

★ 8 ★ 1 ★ 20

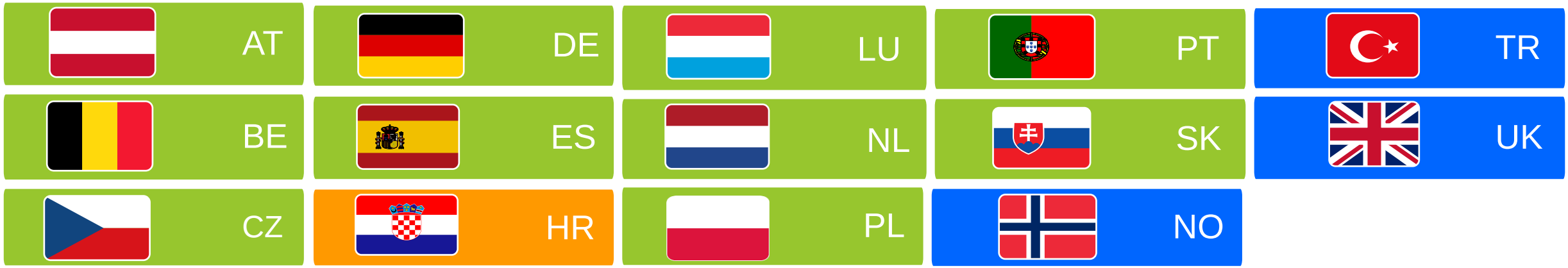
3 EU Member States are not participating in the work of the SRG (CY, LT, MT)

Number of Member States in the SRG - 2025 : **32**

★ 14 (◆ 6) ★ 15

3 EU Member States are not participating in the work of the SRG (CY, LT, MT)

SRG Survey on how to improve SRG working process



7 Questions	
In line with the Council Regulation (EU) 2021/2085 of 19 November 2021 ("the Single Basic Act"), Article 20, paragraph 3, SRG meetings should take place at least twice a year. Following a suggestion from the Chair, do you agree that, for these two meetings, in-person attendance should be preferred and we should make effort to that end, e.g. try to find synergies with other events in the place of the meeting and extend the agenda to make richer and longer meetings?	(31-27-2-4-1) 9 - 2 - 17
Do you agree that, whenever possible, these two meetings should take place in the Member State holding the EU Council Presidency? This implies that full logistical organisation of the meeting in question is the responsibility of the SRG member representing that Member State.	(31-27-2-4-1) 7 - 2 - 2- 17
If we would have richer and longer meetings, would you feel more motivated to travel to attend in-person SRG meetings?	(31-27-2-4-1) 7 - 4 - 17

SRG Survey on how to improve SRG working process

If the two mandatory meetings (as required by the Single Basic Act) continue to take place exclusively in Brussels, is your Member State / country able to ensure in-person attendance of the nominated representative(s)?	(31-27-2-4-1) 5 - 6 - 17
Does your Ministry consider the possible nomination of the Permanent Representative in Brussels as an alternate? This may facilitate in-person attendance.	(31-27-2-4-1) 1 - 7 - 4 - 17
Do you agree that in function of the subject of the meeting agenda the following organisations could be invited to attend the SRG meeting? Please pick those you think should be on the agenda.	(31-27-2-4-1) 11 - 1 - 17
Do you agree that, based on the expressed request from the ERRAC management, the SRG (represented by the Chair and/or Vice-chair) should take up the role of representing the Member States in ERRAC activities?	(31-27-2-4-1) 7 - 2 - 2- 17

- **Final results (decisions) will be discussed at the next SRG meeting in 2026**

Implementation of the EU-Rail Programme

Innovation Pillar: State of Play and Year 3 Results

Nicolas Furio, Léa Paties, Sébastien Denis & Javier Ibañez de Yrigoyen

Innovation Pillar – 2025 General Overview

By the end of 2025:

The innovation programme delivered **422 deliverables** of which **253** have been published or will be published soon on the EU-Rail website.

25 projects
have been launched including
6 Flagship Projects (Wave 1)
~80 partners *in each FP*

2 projects ended in 2025:
ESEP4Freight and RAIL4CITIES.

Innovation Pillar at the end of 2025

MultiYear Programme

~ 800 participants *of which* ***~ 370 unique entities*** *from* ***28 Countries***

~ 280M€ *of EU funds and* ***~ 330M€ in kind contribution*** *from private members*

MOTIONAL | Travel Wise

Flagship Area 1: Two projects

FP1- MOTIONAL: Mobility management multimodal environment and digital enablers

- **Main objective:** improve **flexibility, efficiency, resilience, and capacity adaptation of European rail network** to support development of a Single European Rail Area. Develop functional **requirements, specifications, and solutions for future European Traffic Management**, including common train planning, operations, automation, ticketing, network management and control.
- **Target solution:** **dynamic network and traffic management at European scale** built upon a harmonized functional system architecture for agile, borderless, and mixed-traffic operations and offering.
- **Benefit:** enables automatic management of cross-border rail traffic, improves service offers, operations, and capacity utilization, and enhances the competitiveness of rail-based mobility chains.
- **Four focus areas:**
  - **SG1**: Railway planning (Capacity Management systems)
  - **SG2**: Railway operations (Traffic Management systems)
  - **SG3**: Integration of Railway services with other modes (B2B)
  - **SG4**: Digital enablers transversal to railway sector

FP1 MOTIONAL
European Rail Network and Mobility Management

- **Total project cost:** 92.600.000,00 €
- **Project duration:** 46 months
- **Number of partners:** 93 (including AE and AP)

COORDINATOR

HACON

OTHER PARTNERS

adif, ALSTOM, mermec, CAF, ceit, DB, enyse, etra, Fairvley Transport, Ferrovie dello Stato Italiane, HITACHI, indra, Jernbane-direktoratet, KNORR-BREMSE, ÖBB Infra, PKP, ProRail, SNCF, THALES, Trafikverket, voestalpine, SJ, FGC

FP1- MOTIONAL

SG1: Improved rail services planning

Implementing solutions that enable a Capacity Management System at the European level

SG2: Improved rail operations

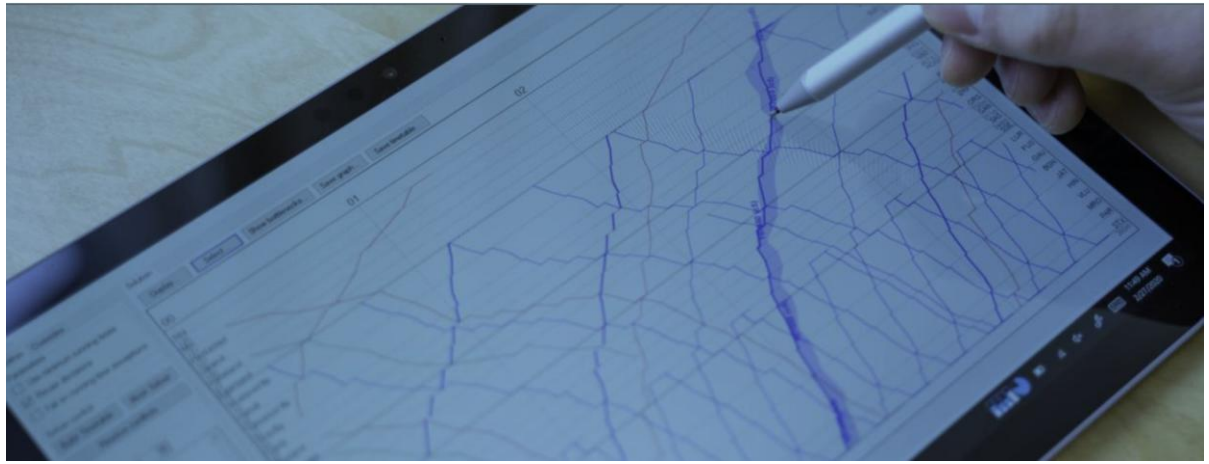
Implementing solutions that enable the integration of national Traffic Management Systems at the European level

SG3: B2B / D2D Multi modal rail integration

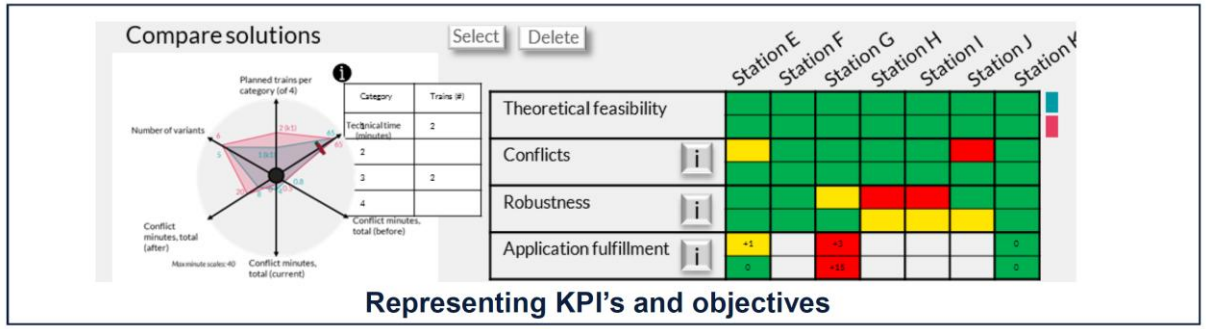
Implementing solutions that support multi-modal rail integration

SG4: Digital enablers to support all Flagship Areas

Conceptual Data Model (CDM) & semantic dictionary evolution; Federated Rail Data Space, Digital Asset Engineering, Digital twin, Repository & validation methodology for use cases across all FPs and SP



Digital tool developed by SINTEF to support short term and long term planning



Representing KPI's and objectives

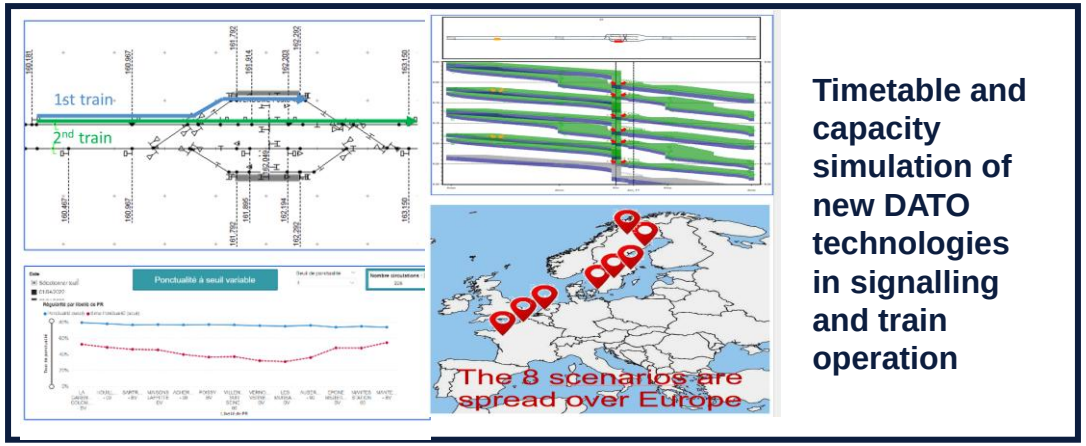
Solutions to support long term planning

FP1- MOTIONAL

2022				2023												2024												2025											
9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
			Start																																		End : Nov 2026

SG1 – Railway planning (Capacity Management systems)

- Algorithms developed for different use cases: e.g. RS planning, train path optimization, decision support in case of modified train paths, etc…
- 28 Demonstrations ongoing



Timetable and capacity simulation of new DATO technologies in signalling and train operation

SG2 – Railway operations (Traffic Management systems)

- Preparation for 31 Demonstrations finalized
- Integration Layer implemented for the demos
- Running of first test cases in the demonstration environments.

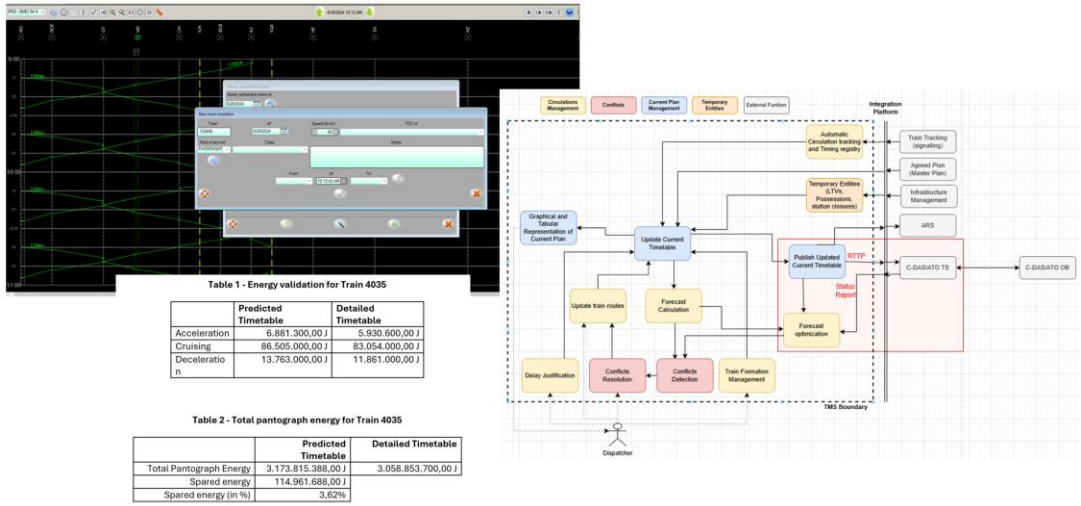


Table 1 - Energy validation for Train 4035

	Predicted Timetable	Detailed Timetable
Acceleration	6.881.300,00 J	5.930.600,00 J
Cruising	86.505.000,00 J	83.054.000,00 J
Deceleration	13.763.000,00 J	11.861.000,00 J

Table 2 - Total pantograph energy for Train 4035

	Predicted Timetable	Detailed Timetable
Total Pantograph Energy	3.173.815.388,00 J	3.058.853.700,00 J
Spared energy	114.961.688,00 J	
Spared energy (in %)	3,62%	

TRL 4 validation of real time connection between national TMSs

FP1- MOTIONAL

2022				2023												2024												2025											
9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
			Start																																		End : Nov 2026

SG3 – Integration of Railway services with other modes (B2B)

- Preparation phase for 15 Demonstrations finalized
- Completion of multimodal interface solutions for ticket distribution, financial clearing and disruption management, ensuring interoperability across mobility providers.
- Validation of end-to-end communication flows, validating their suitability as the backbone for cross-platform information exchange in real-time and for multimodal journey planning.

Totem for assisting PRM passengers at train stations (Málaga María Zambrano Station)

SG4 – Digital enablers transversal to railway sector

- Digital Twin Environment implementation
- Onboarding of a number of partners on the Rail data Space Sandbox + development of first App Store
- Technical Specifications for ETCS trackside equipment Validation Tool delivered – proof of concept under development

FP1- TRAVEL WISE: First rail-aviation synergy project

- **Main objective:** Provide a **solution** to **support the shift from rail and air traffic orchestration in silos to an intermodal approach**
- **Target solution:** **Create a Travel Wise solution and an Intermodal Collaborative Decision Making to support Air-Rail operations management for nominal situations and disruptions**
- **Benefit:** **Optimises rail and air traffic management and improves passenger experience, especially during disruptions**
- **Four phases:**
  - **Benchmarking, &Technical enablers**
  - **Development of monstrations**
  - **Validation**
  - **Replication and scalability**

Travel Wise FA1

- **Total project cost: 6,000,000 €**
- **Project duration: 36 months**
- **Number of partners:** 37 (including AE and AP)

Consortium

Affiliated entities

Associated partner

FLATLAND

FP1- TRAVEL WISE

Benchmarking & Technical Enablers (WP1, WP2)

Benchmarking the rail-air collaboration, define a common rail-air dictionary and establishing of technical enablers

Development of demonstrations (WP3, WP4)

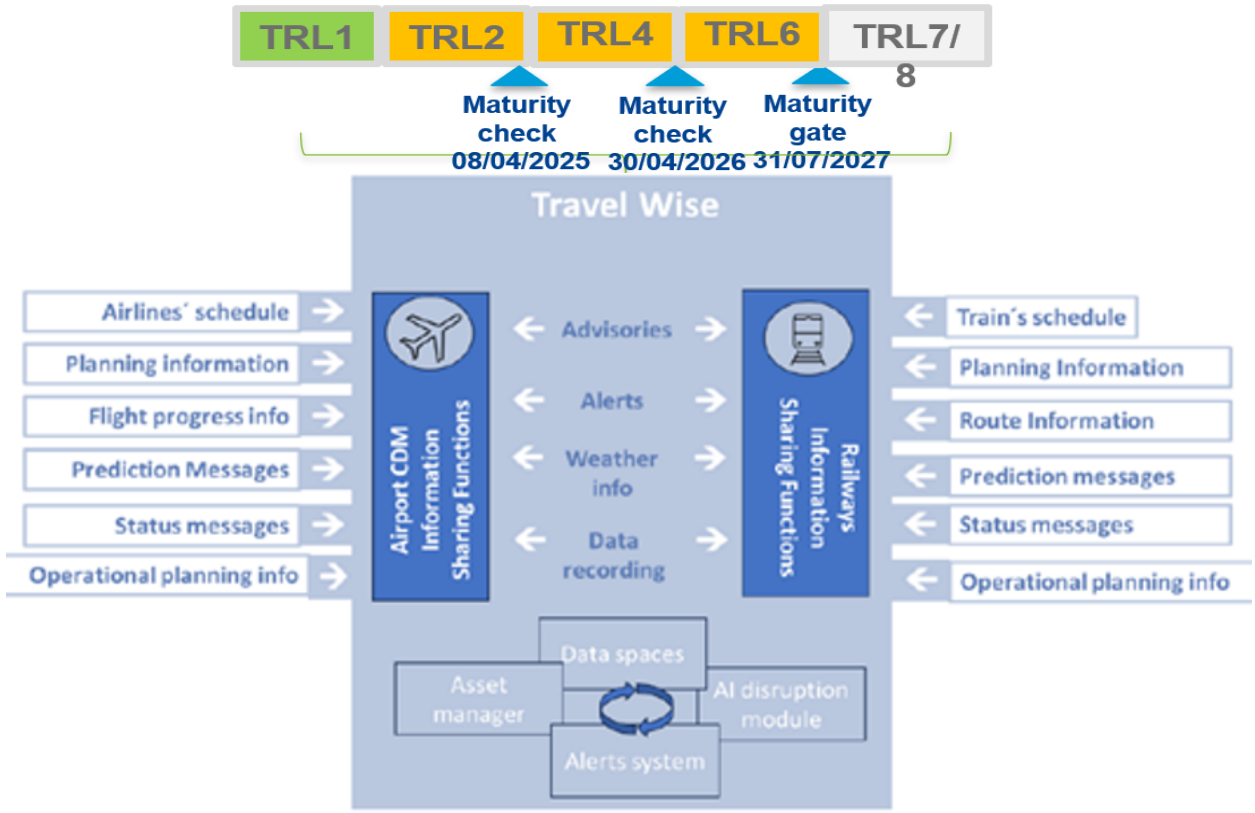
Design and develop the Travel Wise demonstrations

Validation (WP5)

Validation of the Travel Wise solution for three scenarios * Cost Benefit Analysis

Replication and scalability (WP6)

Ensure a wide replicability and scalability through standardisation and exploitation



Travel Wise Solution

FP1- TRAVEL WISE

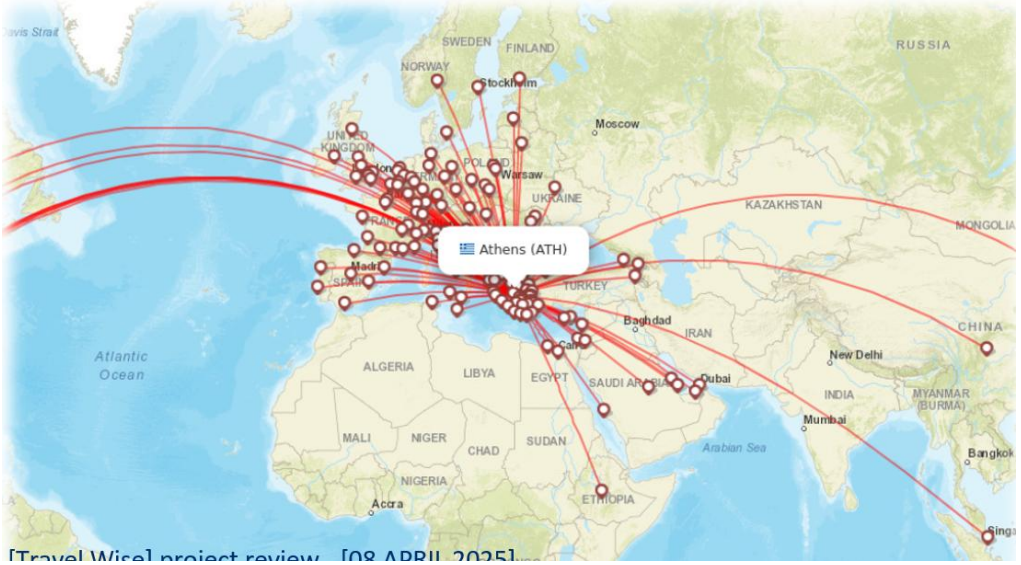
2022				2023												2024												2025											
9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
			Start																																		End : Nov 2026

Benchmarking & Technical Enablers

- Completion of benchmarking activities
- Completion of user requirements elicitation
- Identification of the Travel Wise Technical Enablers
- Delivery of the first version of the Concept of Operations
- Preparation of the Validation Plan

Development of demonstrations

- Initiation of the demonstrations preparations



FP1- TRAVEL WISE

2022				2023												2024												2025											
9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
			Start																																		End : Nov 2026

Validation

- Validation phase will start in 2026

Replication & Scalability

- Initiation of the standardization, replication and exploitation activities

R2DATO | MORANE-2

Flagship Area 2: Two projects

FP2 R2DATO: Rail to Digital Automated up to Autonomous Train Operations

- **Main objective:** take the major opportunity offered by digitalisation and automation of rail operation and to develop the Next Generation ATC and deliver scalable automation in train operations, up to GoA4 for 2030, to enhance infrastructure capacity on the existing rail networks.
- **Target solution:** European solutions fitting requirements from many different use cases across the European network.
- **Benefit:** enables increasing traffic without need for additional investment in physical infrastructure (new railway lines) – enhancing the capacity, maintaining safety levels and operational flexibility.
- **Six focus areas:**
  - **C1**: Automation processes
  - **C2**: Optimised headway
  - **C3**: Enabling digital technologies
  - **C4**: Fast and effective deployment
  - **C5:** Innovative operational solutions
  - **C6:** Demonstrators

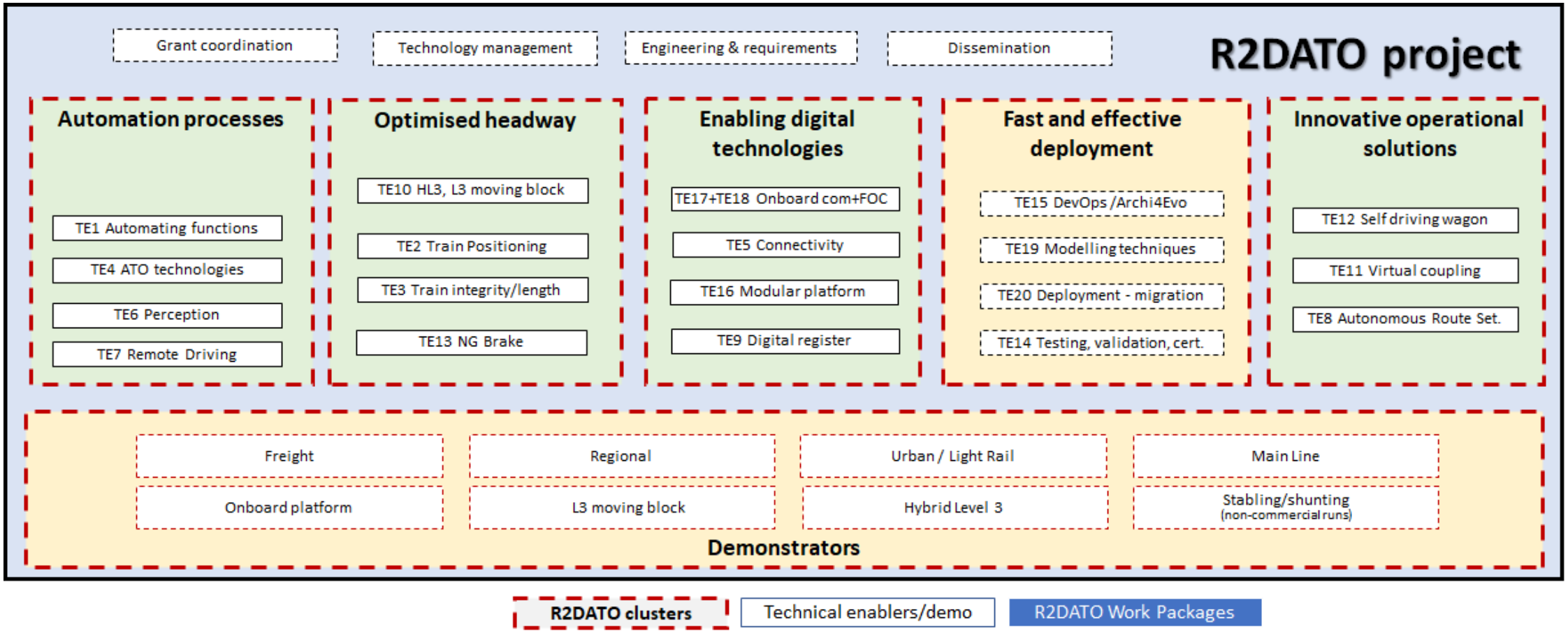
- **Total project cost:** 160.800.000,00 €
- **Project duration:** 42 months
- **Number of partners:** 78 (including AE and AP)

Coordinator

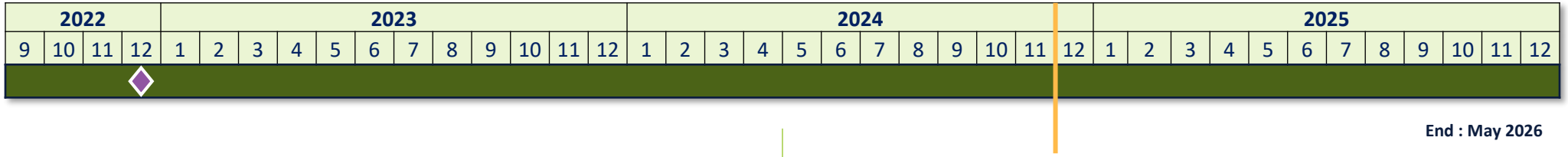
Partners

ASSOCIATED PARTNERS

FP2 R2DATO: Project Overview



FP2 R2DATO



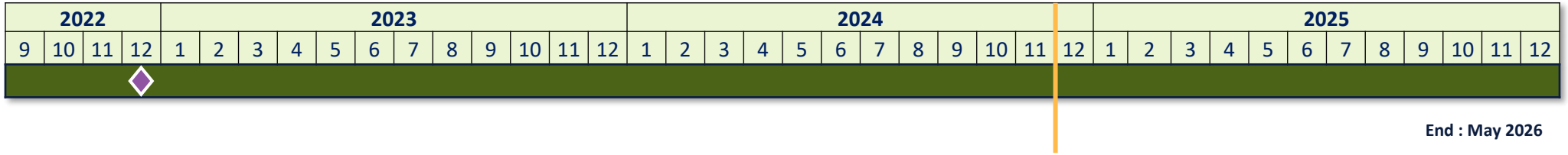
Cluster 1: Automation processes

- **First official baseline of specifications issued.**
- **First prototypes** available. Some were already tested and demonstrated under real operational conditions in the Demonstrators Cluster, e.g. for shunting and stabling applications in mixed traffic conditions.
- Several demonstrations during the year, including RTO in the Netherlands and full ATO GoA4 in the Czech Republic

Cluster 2 – Optimised headway

- First specification was delivered for a **novel system integrating a Radio Block Center (RBC) and Interlocking.**
- Work with ERA, EUSPA & ESA for EGNOS activities (EGNOS4RAIL): draft roadmap and a supporting document justifying the **need for early EGNOS service deployment**
- ASTP: the **generic architecture** progressed Design improvements for all eight ASTP demonstrators were completed

FP2 R2DATO



Cluster 3 – Enabling digital technologies

- **Modular platform**: delivery of a thorough analysis and a set of recommendations for the certification and homologation of Modular Computing Platforms within the European railway system.
- **Digital register**: Demonstrators were developed to facilitate the transfer of static infrastructure data to both trackside and onboard systems, including integration with Moving Block.
- **Onboard communication:** focus on network management functionality, associated processes, and overall system integration.
- **ACS/Gigabit Train:** Laboratory testing done (Technology Readiness Level 4/5)

Cluster 4 – Fast and effective deployment

- DATO business case outlined & required inputs specifications & scheme defined - feedback loop from demos ongoing.
- Common strategy & process for **virtual certification** of complete railway systems as well as functional upgrades defined.
- **DevOPS**: A stakeholder-driven DevOps process framework tailored to the rail domain was defined, incorporating tool support and feedback loops for continuous improvement.

FP2 R2DATO

Cluster 5 – Innovative operational solution

- Operational concept for the VCTS has been delivered, and its system architecture has been consolidated using the Capella modelling tool.
- Lab and pre-tests of the Short Range Communication and RL equipment were conducted, followed by a three-day test campaign using two NS SNG trains in Amersfoort.

Testing in Amersfoort August 2025

Cluster 6 – Demonstrators

- For the 2nd **Urban Demonstrator,** the specific operational test cases being analysed and selected. The preliminary testing and calibration phase to iterate and refine the developments started and the official testing phase will be performed throughout 2026.
- For the **Main Line Demonstrator,** the integration laboratory setup and the electrical and mechanical design was completed. The integration test in the laboratory started and will be continued in 2026.
- The **ETCS HTD/HL3 Deployment Strategies Demonstrator,** consists of various case studies and scenarios in Europe across Spain, Sweden, France, and the Netherlands.
- **Moving Block System Demonstrator,** was successfully tested on the Deutsche Bahn test track in the Ore Mountains, Germany. The test campaign included both single and dual train configurations, effectively demonstrating the moving block concept in real-time.
- The **Stabling and Shunting Demonstrator,** was conducted in the Netherlands, with test runs between Enschede and Hengelo reaching speeds of up to 125 km/h in mixed traffic conditions. These operations were remotely controlled from Utrecht, located 120 km away.

FP2- MORANE-2: MObile radio for RAilway Networks in Europe 2

- **Main objective:** The main purpose of this project is to validate the FRMCS V2 Specifications & V3 target requirements with precommercial FRMCS system components in realistic operational conditions and to feed-back the result to the railway eco-system in order to timely start the migration to FRMCS across the European railway system.
- **Target solution:** Testing and validation of a European specifications for FRMCS.
- **Benefit:** Accelerate the upcoming deployment of FRMCS as a replacement of GSM-R

- **EU contribution:** 13, 4 Million €
- **Project duration:** 34 months
- **Number of partners:** 43 (including AE and AP)

Coordinator

Partners

FP2- MORANE-2

Test design and planning

Test specifications, lab and field test plan and test methodology

System component preparation and architectures

Test architectures, development of system components

Lab test preparations and execution

Three lab tests execution (2026)

Field test execution

Five field tests (2026-27)

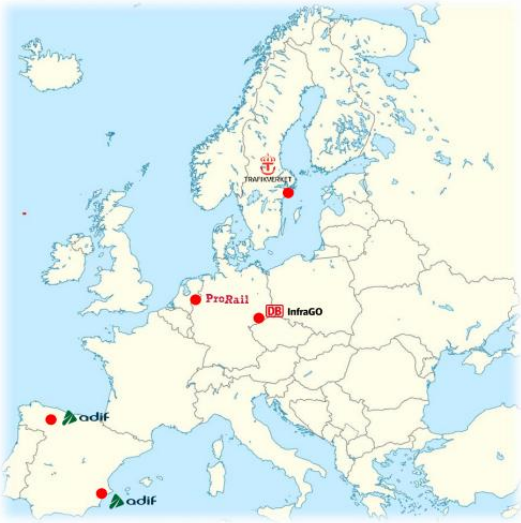
Spain, ADIF
Conventional Line, Max. speed 80 Km/h. León – Matallana. North-west Spain, 25 km lenght. 5 + 5 sites

Sweden, Trafikverket
Conventional Line, Max. speed 200 km/h. Katrineholm – Åby, Central Sweden, 40 km lenght, 9 sites

Germany, DB InfraGO
Conventional Line, Max. speed 80 km/h. Erzgebirge (Markersbach – Scheibenberg), lenght 10 km, 8 sites

Spain HS, ADIF
High Speed Line, Max. speed 300 km/h. Albacete – Alicante. East Spain, lenght 60 km, 24 sites

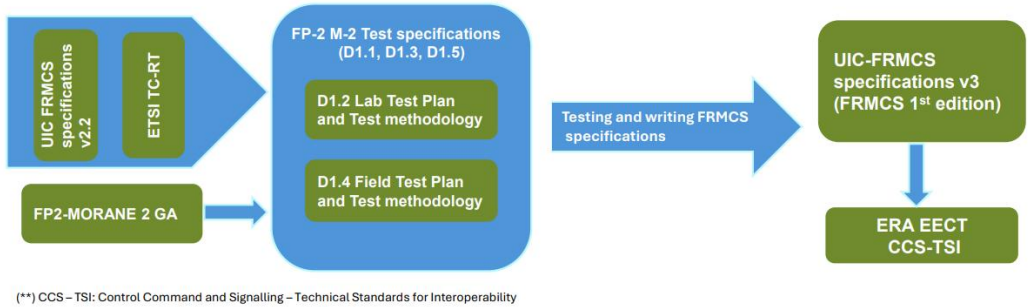
Netherlands, ProRail
Conventional Line, Max. speed 140 km/h. Arnhem – German border, 20 km length, 10 sites



FP2-MORANE-2

Test design and planning

- Test scope for lab and field testbeds have been dispatched to Lab and Field test beds owners.
- Refining of test cases scope with groups dedicated to each field testbed involving supporting labs, before starting writing test cases.
- Planning of the start of test cases writing ongoing.



(**) CCS – TSI: Control Command and Signalling – Technical Standards for Interoperability

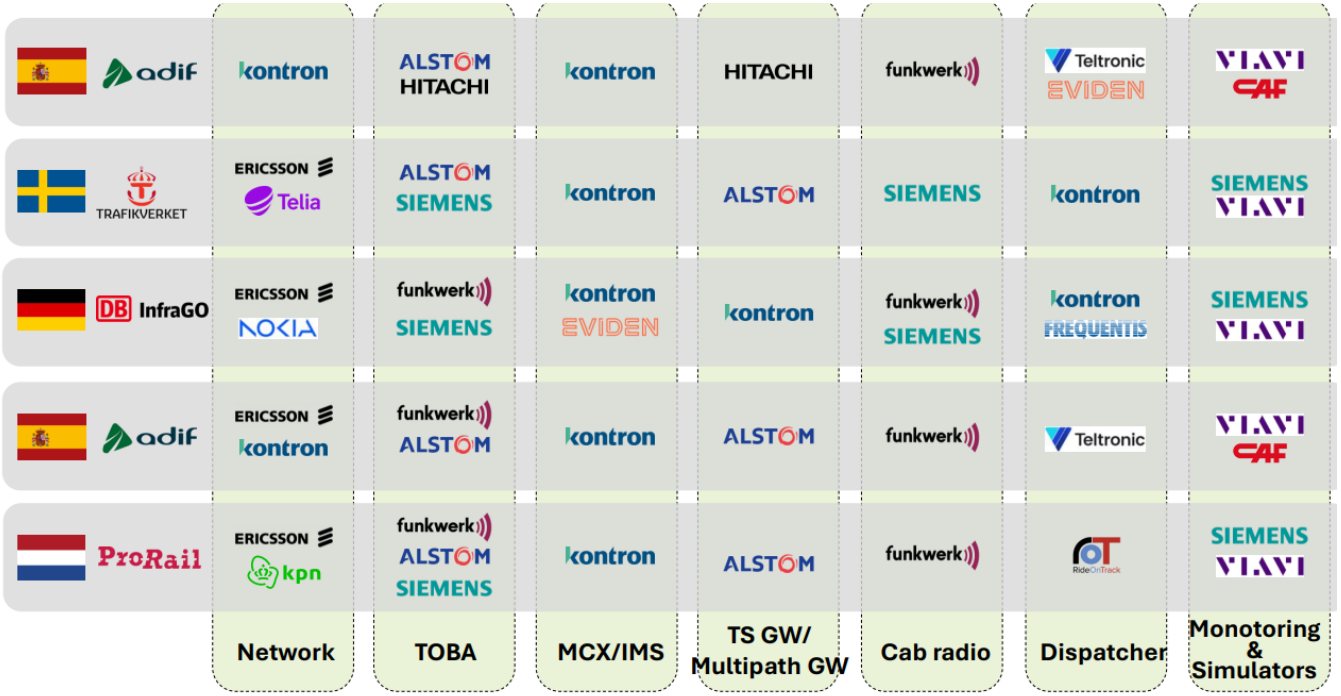
System component preparation and architectures

- Test architecture- E2E Generic Architecture ongoing – to be completed by January 2026.
- Prototypes under preparation.

FP2-MORANE-2

Lab test preparations and execution

- Kicked-off in July 2025
- Interaction among the labs and with the other WPs ongoing.



Field test execution (2027)

- **Spain (ADIF):**
  - Conventional line (max 80km/h)
  - High-speed line (max 300km/h)
- **Sweden (Trafikverket):**
  - Conventional line (max 200km/h) including MNO
- **Germany (DB):**
  - Conventional line (max 80km/h) including cross-border
- **The Netherlands (PRORAIL):**
  - Conventional line (max 140km/h) including MNO

IAM4RAIL

Holistic and Integrated Asset Management for Europe‘s RAIL System

Flagship Project 3

FP3 IAM4RAIL: Holistic and Integrated Asset Management for Europe‘s Rail System

- **Main objective:** provide innovative technical requirements, methods, solutions, and services based on the latest cutting-edge technologies to **minimise asset lifecycle costs** and **extend service life** while meeting safety requirements and **improving the reliability, availability, and capacity of the railroad system.**
- **Target solution:** **Intelligent Asset Management System** for both **Rolling Stock** and **Infrastructure;** Increased level and technology for **automation and robots** in construction and maintenance/.
- **Benefit:** **Cost-effective** asset management, increased **RAMS** and **capacity** of the overall railway system. **Sustainable** production of **resilient** assets
- **Five focus areas:**
  - **SP1**: Wayside Monitoring and TMS link
  - **SP2**: Rolling Stock Asset Management
  - **SP3**: Infrastructure Asset Management
  - **SP4**: Railway Digital Twins
  - **SP5**: Environment, User and Worker Friendly Railway Assets

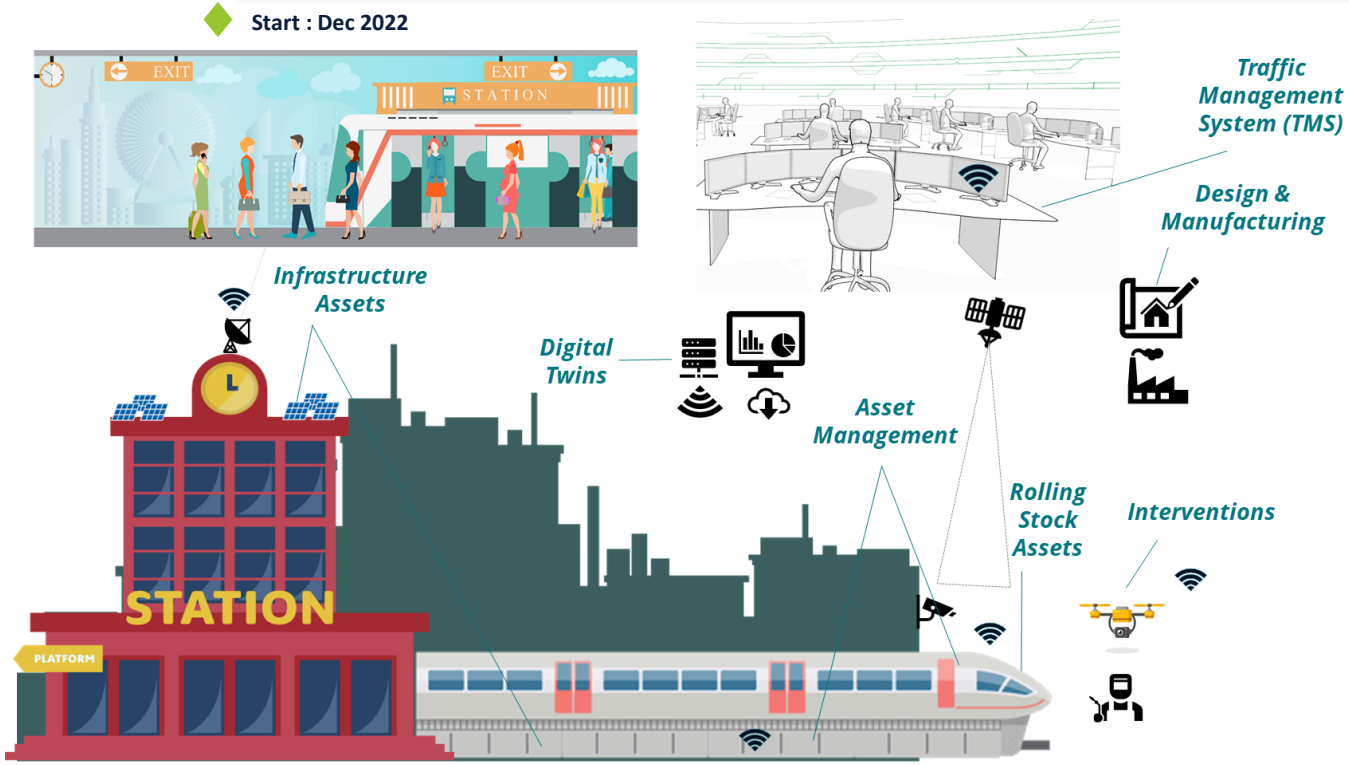
- **Total project cost:** 106.900.000 €
- **Project duration:** 48 months
- **Number of partners:** 93 (including AE and AP)

COORDINATOR

OTHER PARTNERS

FP3 IAM4RAIL

2023				2024												2025												2026											
9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Start : Dec 2022																																					End



Holistic and Integrated Asset Management

Implementing a comprehensive approach that considers maintenance, operations, financial aspects, and overall system performance

Cost-Effective Solutions

Developing a common European asset management framework using digital technologies and data analytics to minimize lifecycle costs and extend the service life of rail assets

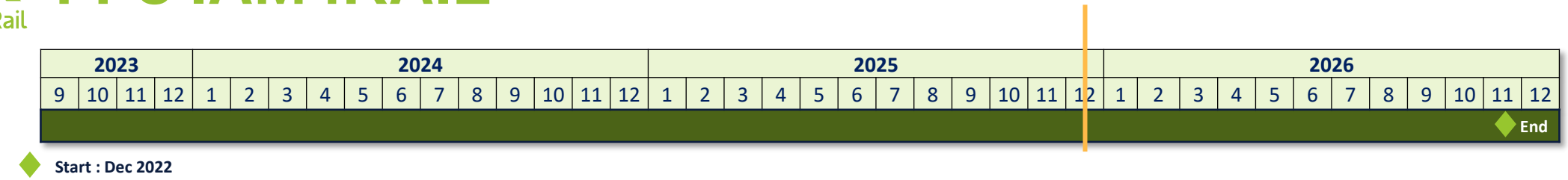
Safety and Reliability

Enhancing the safety, reliability, availability, and capacity of the rail system through innovative technical solutions and services

Advanced Decision-Making

Utilizing AI and digital twins to improve decision-making accuracy, predict anomalies, and optimize maintenance strategies

FP3 IAM4RAIL

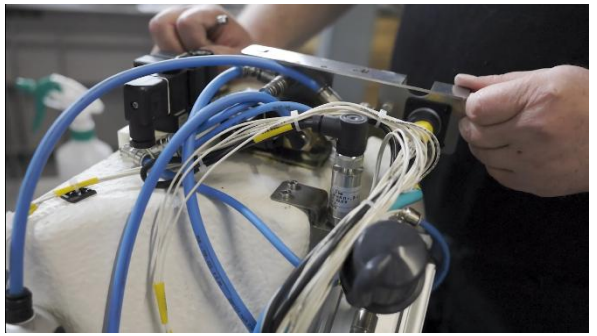


SP1 – Wayside Monitoring and TMS link

- Installation achieved in the 2 Use Cases.
- IAMS analytics models for anomaly detection, fault prediction, and maintenance strategies developed
- Dashboards for asset status visualization / and alarm management created
- Interface between IAMS and TMS defined with the main objective of enabling the exchange of diagnostic and operational data

SP2 – Rolling Stock Asset Management

- Data acquisition and monitoring technologies for both on-board and wayside monitoring technologies finalized.
- Integration into analytics platforms capable of identifying anomalies.



- Several Railway Checkpoint configurations deployed and validated

FP3 IAM4RAIL

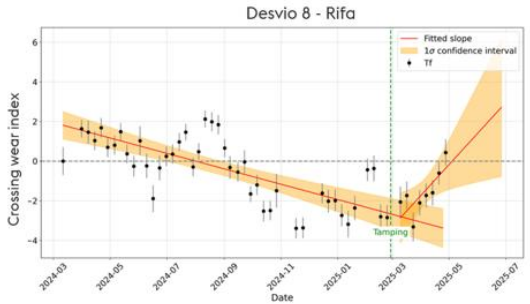
2023				2024												2025												2026											
9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12

Start : Dec 2022

End

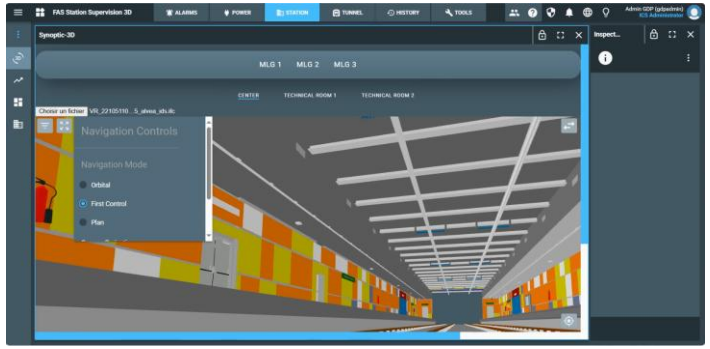
SP3 – Infrastructure Asset Management

- Decision-support tools for long-term infrastructure maintenance validated in operational environments
- Demonstration campaigns completed for most of the Advanced Sensing and Prescriptive Maintenance Use Cases. Analysis and Validation on-going.
- Half of the 13 specific applications on Multi-source Data and Reality modelling demonstrated operational reliability, other being refined for future deployment.



SP4 – Railway Digital Twins

- Advanced level of integration for the BIM-based Digital Twin of Málaga Zambrano station achieved, becoming an operational environment capable of supporting predictive management and real-time asset monitoring



- Upgraded deployment in 3 stations of the trash detection system with real-time dashboards for station operators and classification algorithms
- Pilot deployment of the Virtual Certification Framework, integrating blockchain-based traceability for selected infrastructure components

FP3 IAM4RAIL

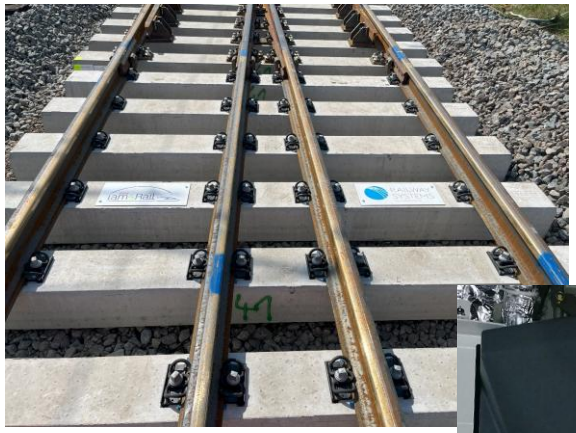
2023				2024												2025												2026											
9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12

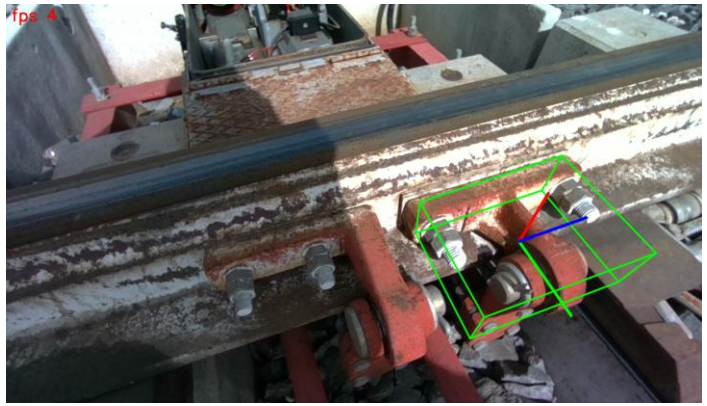
Start : Dec 2022

End

SP5 – Environment, User and Worker Friendly Railway Assets

- Green turnout demonstrator installed
- AM: Production of a door panel compliant with flame retardancy standards
- Progress on the maturity of the robotic platforms and their actuators (The track object placement robot will used as part of a contract on the Dutch network)
- Prototype of Exoskeleton in integration phase and AR system architecture finalized. Validation in representative environment underway.





RAIL4EARTH

A sustainable and green rail system

Flagship Project 4

FP4-RAIL4EARTH: Sustainable and green rail systems

- **Main objective:** provide new innovative products and services based on leading edge technologies to **minimize the overall energy consumption** and **environmental impact** of the railway system, to make this transportation mode **healthier, more attractive** and to provide **resiliency against climate change**
- **Target solution: Enhanced rolling stock, infrastructure, stations, and all their related sub-systems** (traction, bogies, brakes, energy storage systems, HVAC, etc.)
- **Benefit:** improve the existing sustainability performance of railways, more attractive and resilient transport mode.
- **Six focus areas:**
  - **SP1**: Alternative (to Diesel) energy solutions for the rolling stock
  - **SP2**: Energy in rail infrastructure and stations
  - **SP3**: Sustainability and resilience of the rail system
  - **SP4**: Electro-mechanical components and sub-systems for the rolling stock
  - **SP5**: Healthier and safer rail system
  - **SP6**: Trains Attractiveness (Interiors)

- **Total project cost:** 95.100.000 €
- **Project duration:** 48 months
- **Number of partners:** 71 (including AE and AP)

FP4 RAIL4EARTH

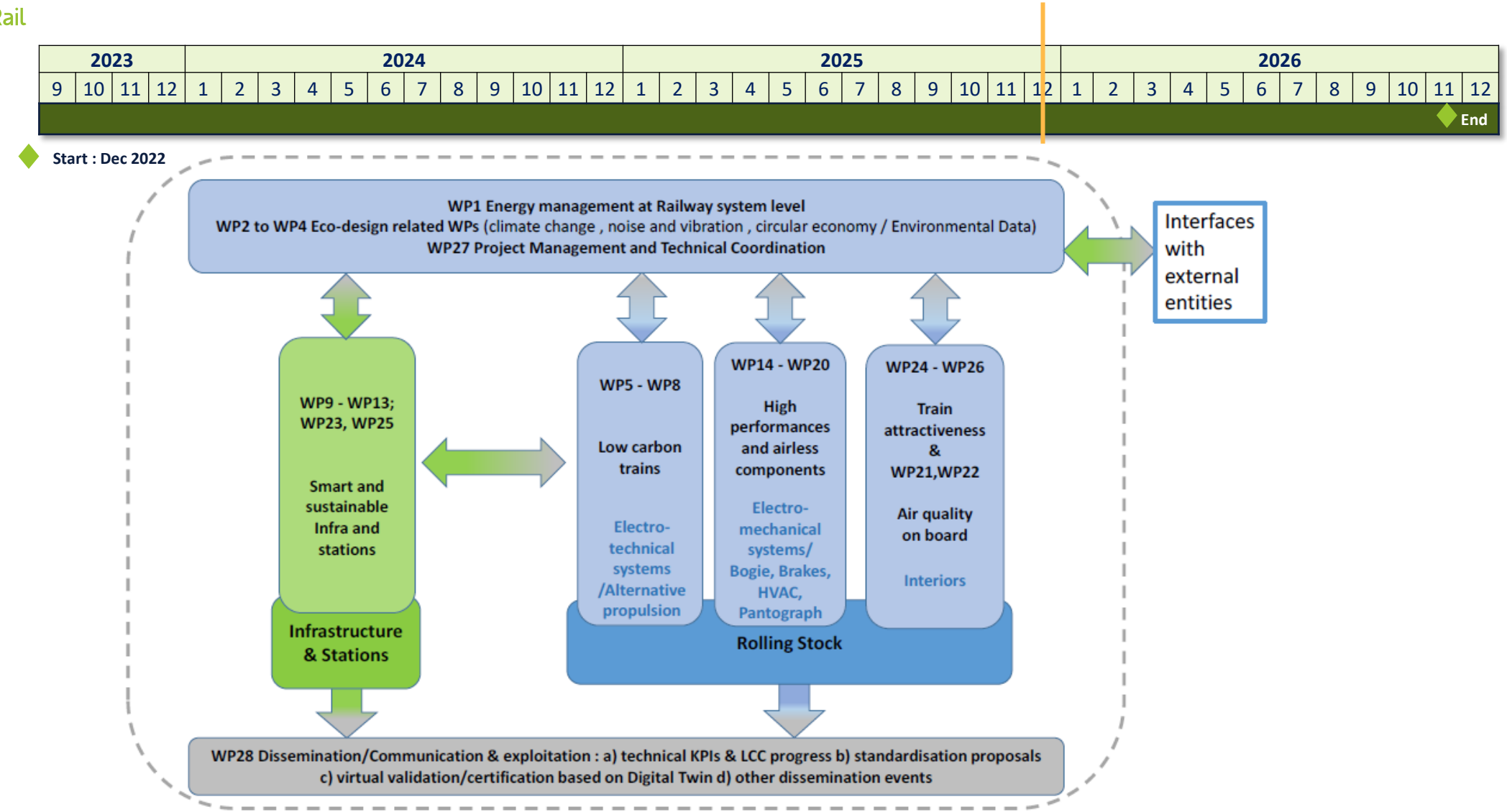


Figure 1: Schematic diagram of Rail4EARTH

FP4 RAIL4EARTH

2023				2024												2025												2026											
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Start : Dec 2022

End

SP1 – Alternative (to Diesel) energy solutions for the rolling stock

- Battery cells for the High-performance BEMU demos validated in laboratory and lab test on-going for the complete traction chain of the North Europe BEMU demo.
- Predictive models for train energy consumption have been developed enabling virtual optimization of energy use under real operational scenarios
- Developments of hydrogen storage technologies in trains completed.
- Mechanical design and integration of the metal hydrate reactor in the H2 hybrid loco finalized

SP2 – Energy in rail infrastructure and stations

- Models and tools developed for hydrogen refueling station location optimization validated
- Initial design of a mechanical refueling interface (SAE J2601-compliant) completed.

- Pilot demonstrator of urban Energy hub in a light urban rail environment as energy storage on DC side, installed, and data collected to evaluate its performance in real environment.

FP4 RAIL4EARTH

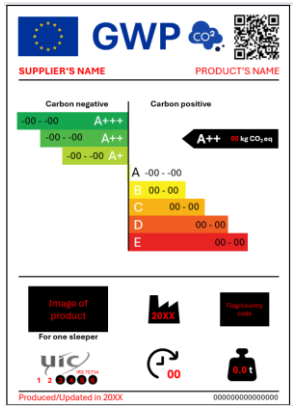
2023				2024												2025												2026											
9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12

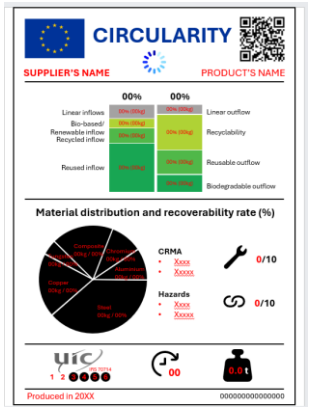
Start : Dec 2022

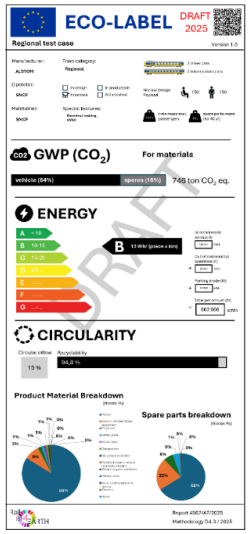
End

SP3 – Sustainability and resilience of the rail system

- Noise and vibration:
  - Second version of Neoballast produced, based on recycled substrate, for being tested next year.
  - Catalogue for curve squeal mitigation methods finalized
- Circular economy solutions: first version of the ecolabels completed





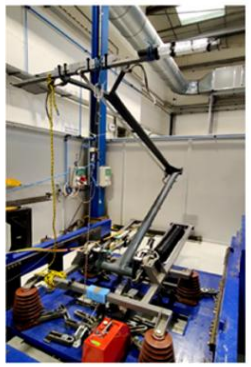


SP4 – Electro-mechanical components and sub-systems for the rolling stock

- Air-less brake: integration studies on one train in UK finalised. Good progress reported to support regulatory and certification processes.
- E-Panto: 2 prototypes being built for equivalent system test bench to train environment + wind tunnel aerodynamics test.
- HVAC: engineering and production of the HVAC units demonstrators on-going

Uplift and down lift test

Sinus test



ADD Test

Faiveley Transport
A Wabtec Company

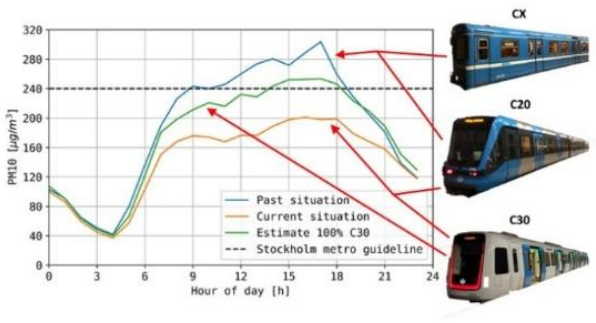
FP4 RAIL4EARTH

2023				2024												2025												2026											
9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Start : Dec 2022																																					End

SP5 – Healthier and safer rail system

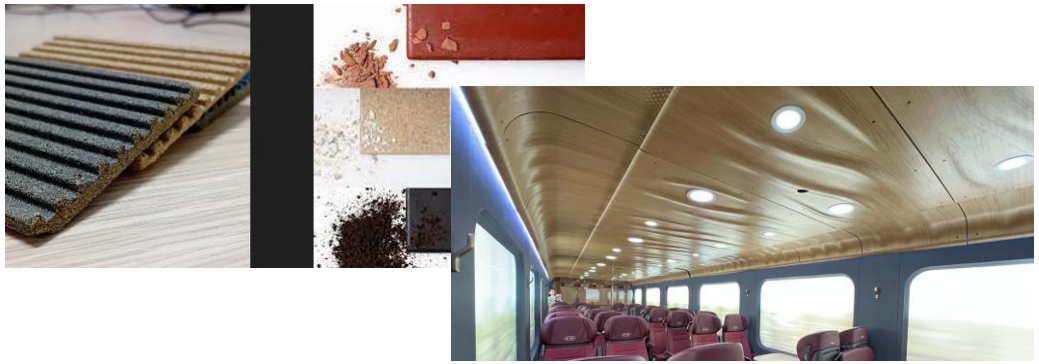
- Air quality in passenger cars - Air treatment centralized solutions:
  - Validation of PEPA-F ™ pathogen filter in train and particulate filter in train completed as well as for Purevector system.
  - Specific tests to the HVAC system on-going (Long Life Filter, Dielectric Barrier Discharge ionization system)

- Air quality in tunnel and underground stations: PM1, PM2.5, and PM10 measurements at Stockholm Central Station completed, and used as inputs for several machine learning-based prediction models



SP6 – Trains Attractiveness (Interiors)

- Proof of concept for quick fixing systems for interior modules validated
- Additive manufacturing with wood process has been tested with a mock-up of roof panel. Fire & Smoke tests on-going.



- Two immersive tools, 3D virtual reality configurators of train layout, developed (1- for train supplier to facilitate the exchange with the customers, 2- for operators to valid the feasibility of refurbishments),

FP5-TRANS4M-R / FP5-DACtiVate

Flagship Area 5: Two projects

FP5-TRANS4M-R: Transforming Europe's Rail Freight

- **Main objective:** European **harmonised, scalable, upgradable DAC systems** to support digital-enabled **operational procedures** and digital **yard automation** and management solutions. **Maximise flexibility and reliability of rail freight service**s by providing **effective intermodal prediction algorithms** and **seamless planning** covering the complete end-to-end rail service

- **Target solution:** Increase in capacity, productivity, efficiency and flexibility of rail freight operations, responding to **customer demands** in a timely and flexible manner.

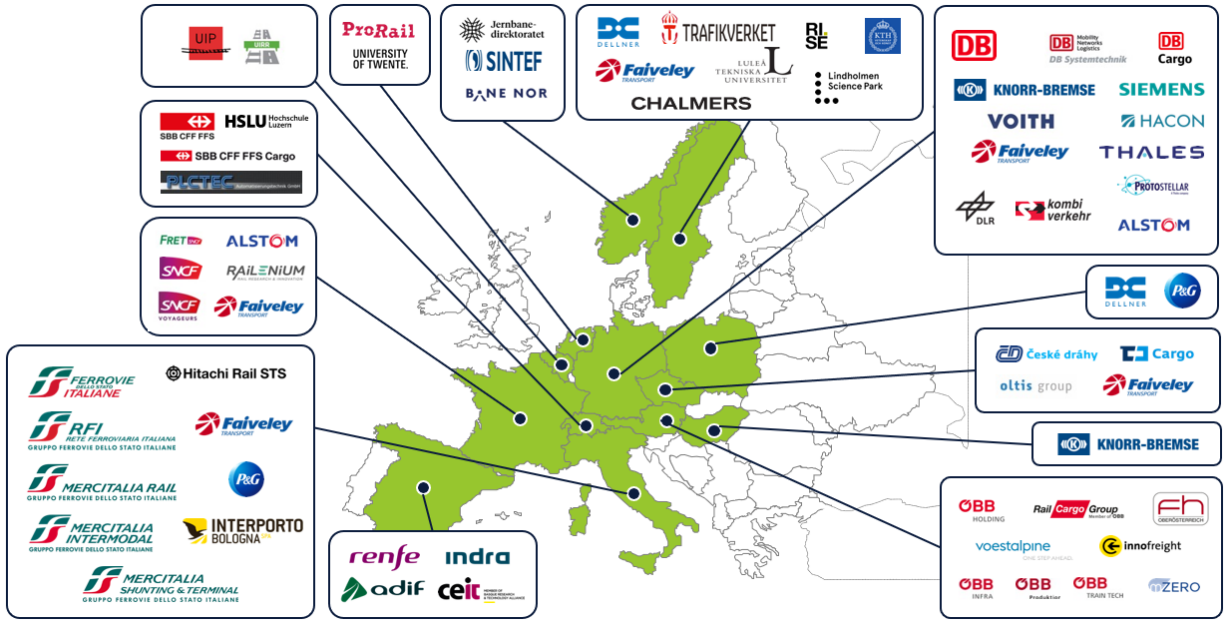
- **Benefit:** enable management of cross-border rail traffic,

  improve rail freight services and operations

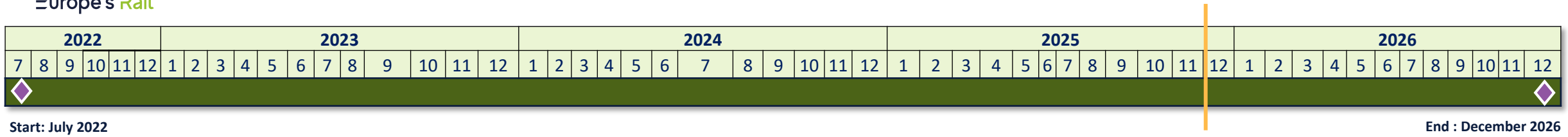
- **Focus areas:**
  - **WS1: Full Digital Freight Train Operations (FDFTO)**
  - **WS2: Seamless rail freight (Seamless)**

FP5TRANS4M-R
Transforming Europe's Rail Freight

- **Total project cost:** 97.500.000,00 €
- **Project duration:** 54 months
- **Number of partners:** 76 (AEs included)



FP5-TRANS4M-R



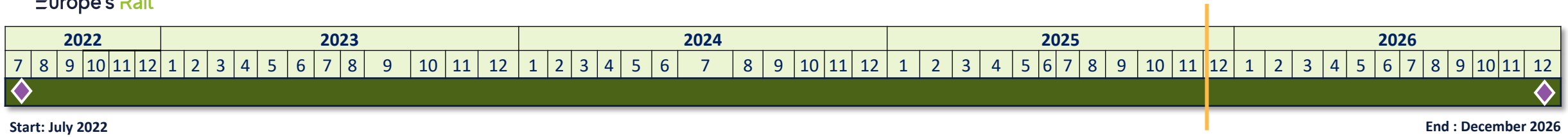
Start: July 2022

End : December 2026

WS1: Full Digital Freight Train Operations (FDFTO)

- Authorisation strategy and overall safety plan
- Preliminary Operational Procedures & System Requirement Spec FDFT & FDFTO User Requirements Specification
- Risk assessment and harmonised safety architecture
- Requirements specification for Yard Automation
- DAC Level 4 Functional Tests Report. Two demonstrator trains are already up and running in commercial service in Sweden
- Complementing the specifications and test planning, the interoperable power supply programme advanced materially in 2025
- Automated Yard Operations integration progressed with an ASO device and wagons being equipped with DAC and FDFT systems for demonstrating ASO and FDFT operations in flat and hump yards
- Stakeholder engagement continued. Transparency on demonstrator schedules, vehicle conversion readiness and test execution

FP5-TRANS4M-R



WS2: Seamless rail freight (Seamless)

- There are several use cases prepared on the cross-border corridor Malmö/Sweden – Alnabru/Norway
- Foundations for Railway Checkpoints and demonstrations are ensured through joint vision and deployment work across FA3 and FA5
- Data sharing of train runs established but facing some difficulties to train the models with the amount of data available
- Checkpoint deployments matured and intelligent video gates and way side checkpoints are operated across multiple networks (Germany, The Netherlands, Sweden and Spain)
- Seamless planning and dynamic dispatching capabilities evolved. Progress in further developing and connecting advanced planning tools (incl. optimisation algorithms)

FP5-DACtiVate: Activating DAC Development Through Testing and Engineering

Total project cost: 10,726,665.84 €
Project duration: 25 months
Number of partners: 21 (AEs included)

Main objective: advance the full digitalisation of freight train operations in Europe, aiming to **enable the pre-deployment of pilot trains with Digital Automatic Coupling (DAC) by executing required additional tests to the complementary project FP5-TRANS4M-R.** Establishing confidence before full implementation, while enabling DAC authorisation processes.

Target solution: test the interchangeability of DAC components, expand the number of Wagon Onboard Units in line with FP5-TRANS4M-R's system architecture and enable thorough validation of the pre-deployment trains by additional locomotives able to integrate hybrid couplers.

Benefit: Collaboration with FP5-TRANS4M-R is vital to align with its functional specifications and technical architecture, ensuring the project's contributes to the related DAC authorisation process

Focus areas:

WS1: Derailment and propelling safety tests, crash tests, climate chamber to prove interchangeability of DAC coupler head/shank and draft gear across DAC solutions

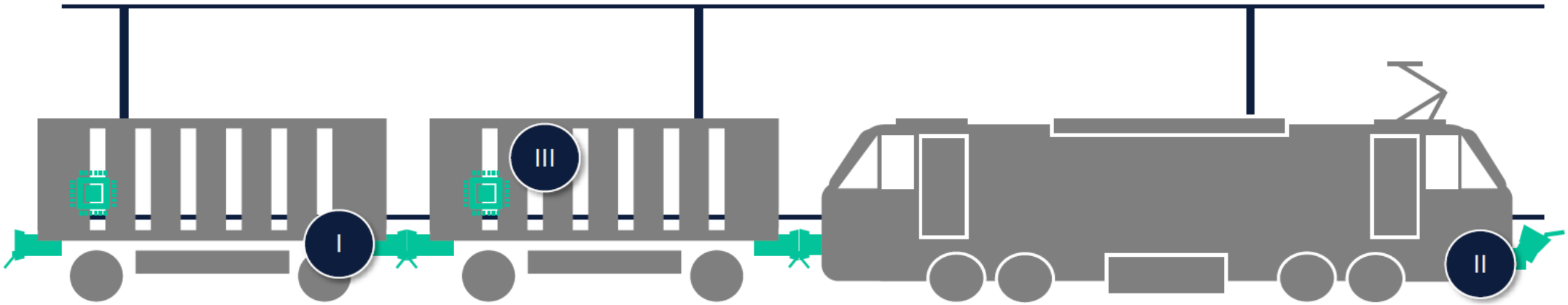
WS2: Mix and match tests – test specification, execution and validation preparation for DAC subsystem interchangeability

WS3: Technical analysis and fitting solutions for hybrid coupler for mainline and shunting locomotives

WS4: Provision of wagon on-board unit prototypes for FP5-TRANS4M-R

21 Partners from all over Europe

FP5-DACtiVate



I **DAC Testing**

Validation Tests
Mix&Match Interface A

II **Hybrid Coupler for Locomotives**

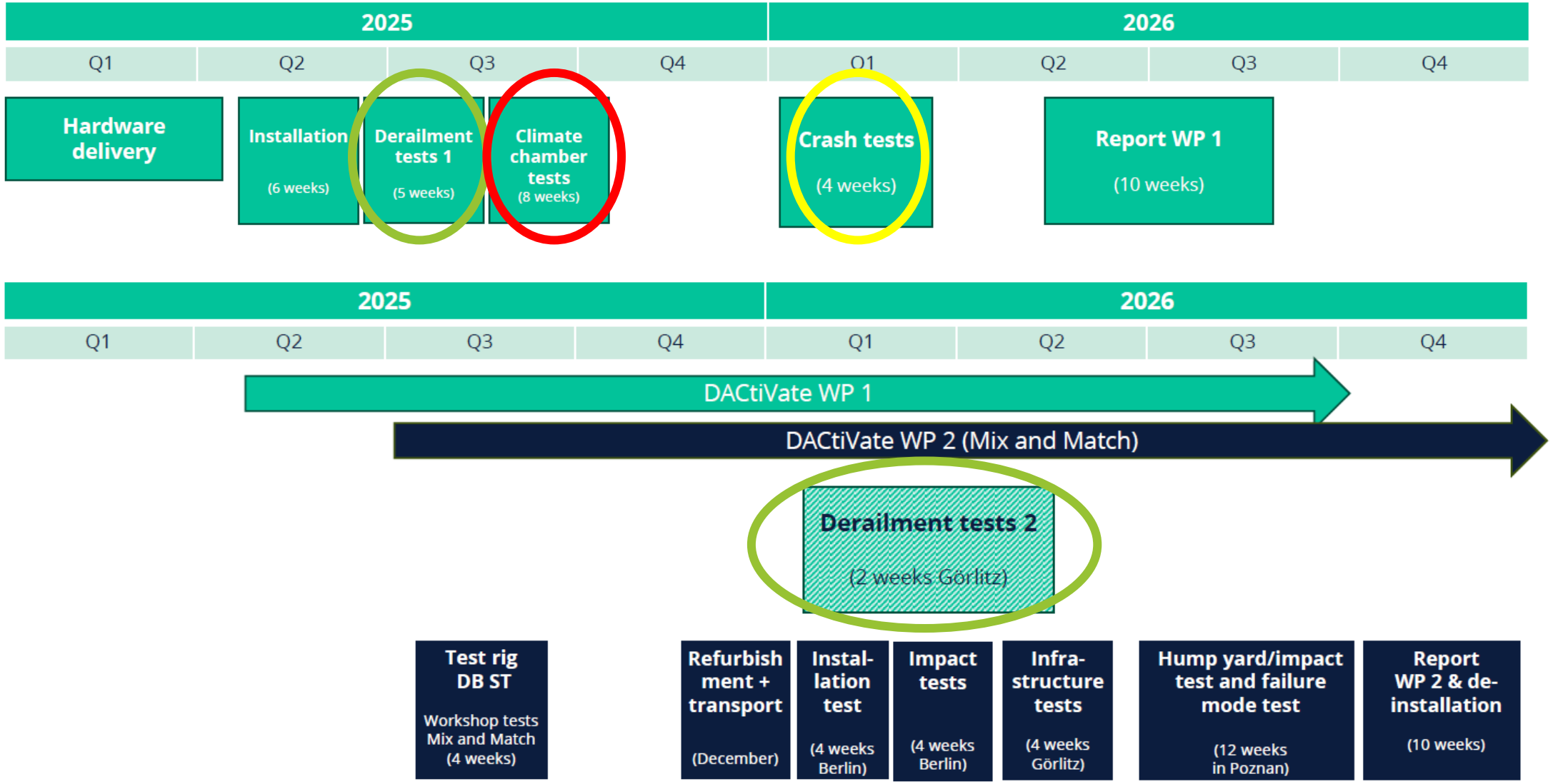
DAC integration

III **Wagon Onboard Units**

WOBU provision for
Train Test Lab

Enabling DAC Pre-Deployment
in **close collaboration** with **FA5 projects**

FP5-DACtiVate Timeline on tests



FutuRe

Flagship Project 6

FP6 – FutuRe: Delivering Innovative rail services to revitalise capillary lines and Regional rail services

Project motivation

- Regional railway **lines need to be revitalized or even rebuilt to make them economically, socially, and environmentally sustainable** and meet the current customer needs but also reduce CO2 emissions of the European transport sector.

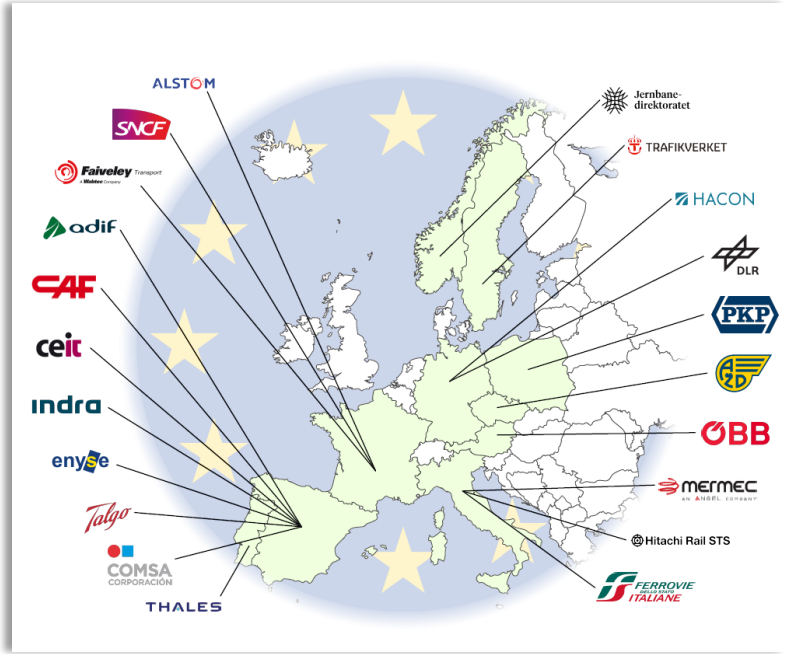
- **Target Solutions:** a concept tailored to regional railways that includes digitalization, automation and utilization of mainstream and emerging technologies for signalling and trackside components, rolling stock and customer information.

- **Benefit:** Long term viability of regional railways, lower CAPEX and OPEX, increasing quality and reliability of the service, improving customer satisfaction

- **Focus Areas:**
  - **SA1**: Suitable Regional System Solution
  - **SA2**: Cost efficient performing CCS system
  - **SA3**: Optimised Railway Asset
  - **SA4**: Sustainable Rolling Stock
  - **SA5**: Suitable Customer Service

FP6-FutuRe
Cost effective regional lines

- **Total Project Costs:** 32.9M EUR
- **Project duration:** 48 months
- **Partners:** 50



FP6 – FutuRe: Time plan and status

Coordinator	Alessandro Mascis [FT]	**Start**	[01-12-2022]	**Participating Companies**
FPM	Franz-Stefan Weigl [OBB]	**Duration**	[M48]	*1 - FT, 2-ADIF, 3-Alstom, 4-MERMEC, 5-AZD PRAHA, 6-CAF, 7-CEIT, 8-DLR, 9-COMSA, 10 ENYSE, 11-FS, 12-HITACHI, 13-INDRA, 14-NRD, 15-OBB-Infra, 16-PKP, 17-HACON, 18-SNCF, 19-GTSP, 20-TRV, 21-ÖBB-PV*

2022				2023												2024												2025												2026											
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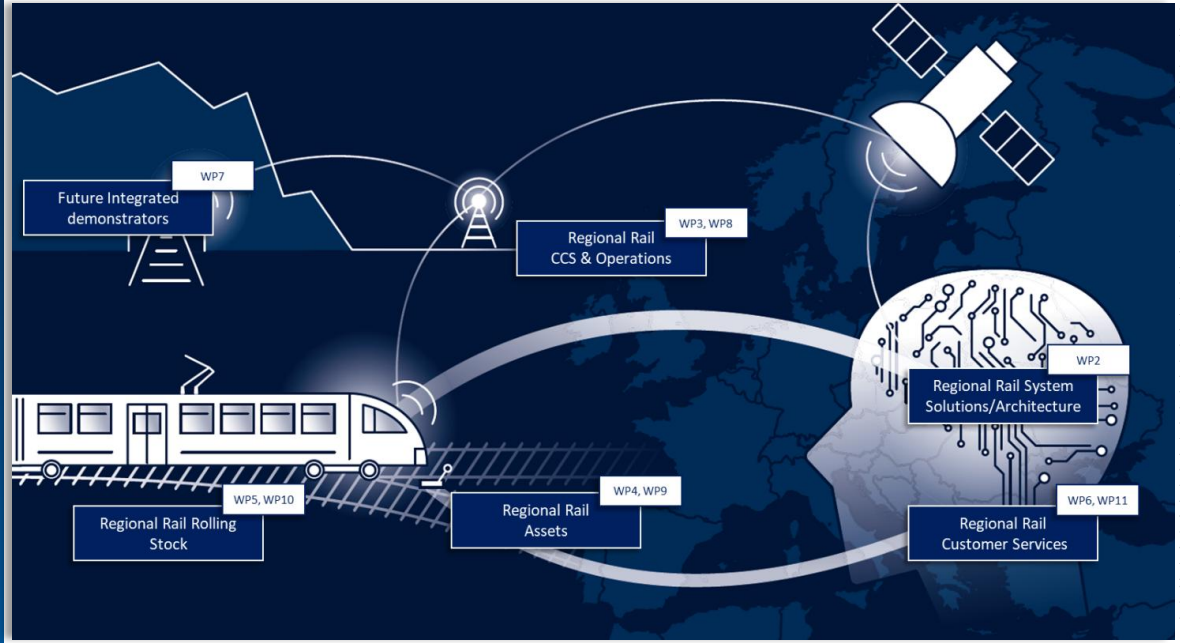
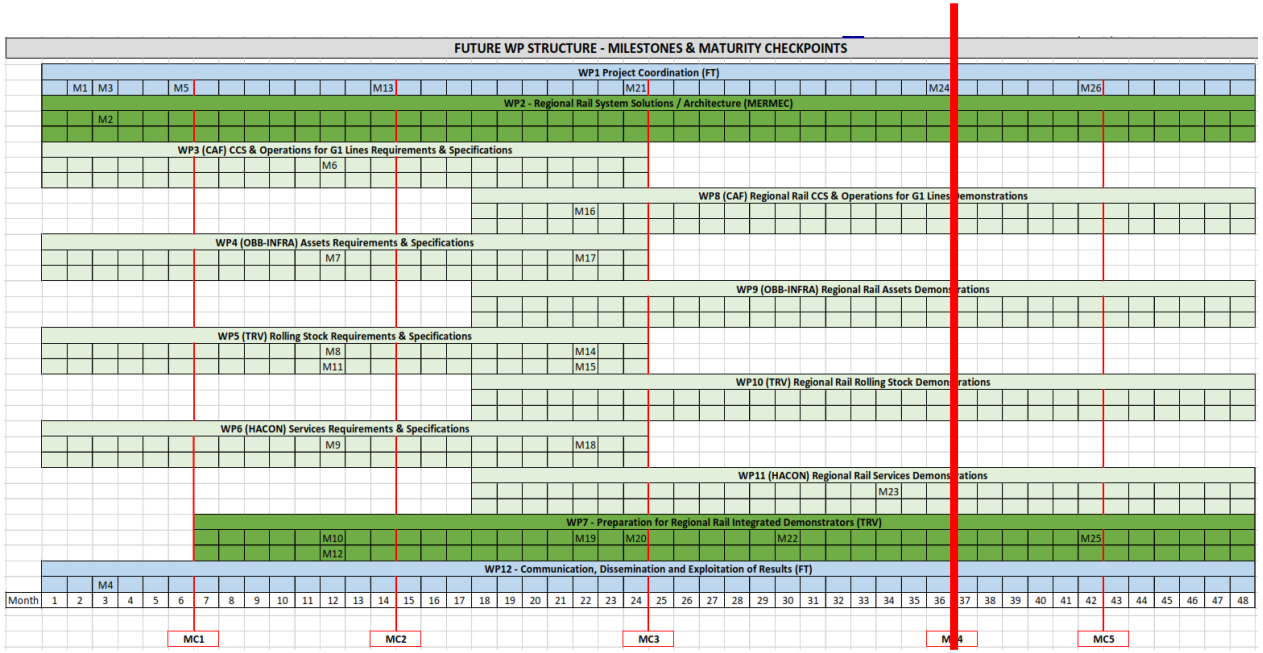
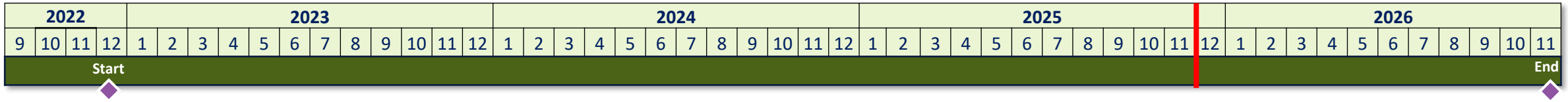




FP6 FutuRe



Area 1 - Suitable Regional System Solution

- Specifications of requirements and setup of scenarios for the FP6 Technical Enablers updated considering input from FPs and SP
- System Architecture for the FP6 Technical Enablers updated considering input from FPs and SP
- Key Performance Indicators with preliminary quantitative results

Area 2 – Cost efficient performing CCS system

- Demonstration activates ongoing: ATO over ETCS with GoA2/GoA4, Hybrid Level3, Traffic Management System, cost-effective fail-safe highly accurate train positioning, cost effective fail-safe on-board train integrity & train length, multi-bearer communication platform – 17 demonstrators
- Preliminary specification of requirements for digital platform for CCS validation and TSI certification
- Definition of G2 Lines concept: demonstration activities ongoing for integrated RBC/IxL, accurate high precision fail safe position demonstration on non interoperable lines – 2 demos

FP6 FutuRe

2022				2023												2024												2025												2026										
9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11
Start																																																	End

Area 3 – Optimised Railway Asset

- Demonstration activities are ongoing for wayside infrastructure assets - 4 demos
- Demonstration activities are ongoing for communication covering track-train and track-cloud communications - 5 demonstrators

Area 4 – Sustainable Rolling Stock

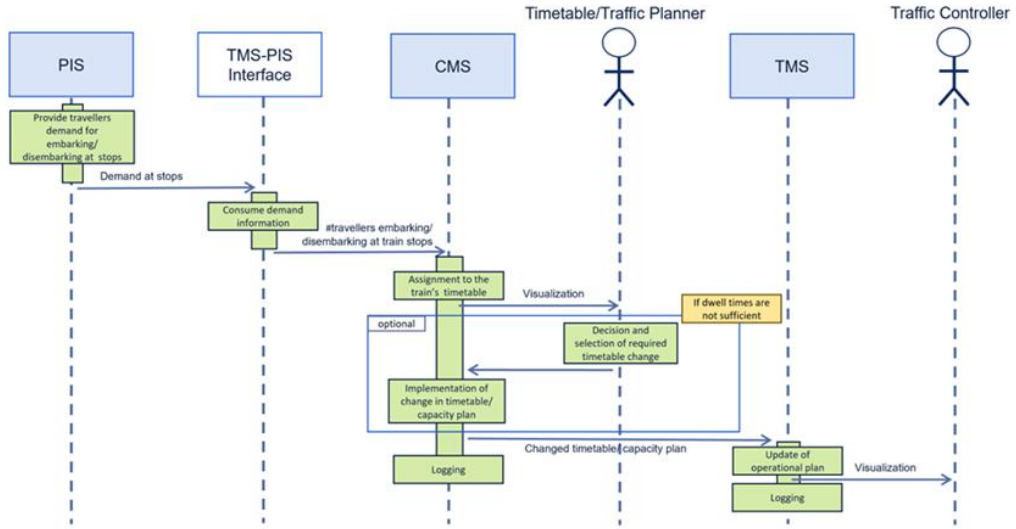
- 2 concept design for lightweight, emission free rolling stocks with modular interior.

FP6 FutuRe

2022				2023												2024												2025												2026										
9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11
Start																																																	End

Area 5 – Suitable Customer Service

- Demonstration activities are ongoing for Traffic Management Systems Passenger Information Systems integration
- Demonstration activities are ongoing for Multimodal Travel services including freight
- Demonstration activities are ongoing for AI based demand prediction integrated in multimodal travel analysis and congestion monitoring algorithms



Flagship Area 7

EU Rail: Flagship Area 7 of the Innovation Pillar

VISION of FA7

Develop **the next generation of railway transport systems** based on **fully automated multimodal mobility systems** for passengers and goods, which are **sustainable and interconnected**, **more flexible**, **natively digital, standardized and scalable**, enabling **new business models** towards on-demand mobility

OBJECTIVE of FA7

Explore non-traditional and emerging flexible and/or high-speed guided transport systems, as well as to create opportunities for innovators to bring forward ideas for shaping those future systems via a scientific approach into an existing rail system.

Destination

AUTOMATED MULTI-MODAL MOBILITY-SYSTEM

TARGET @2031 – TRL 5

Destination

MAGLEV-DERIVED TRANSPORT SYSTEMS

TARGET @2031 – TRL 6-7*

Destination

UNCONVENTIONAL FAST TRACK-BOUND TRANSPORT SYSTEMS

TARGET @2031 - TRL 5-6*

*with the assumption that other complementary initiatives and programs

Flagship Area 7: Progress in 2025

pods 4 RAIL

Objective: to develop a concept for Pods and Pod-Carriers on railway and to identify relevant use cases and business cases.

Key activities:

- Economical and Technical Evaluation of Operational Procedures
- Concept development for vessel equipment
- Concept for the handling, loading/unloading technologies

Starting date: September 2023

Duration: February 2026 | Funding: 3M €

MaDe4Rail 2*

Objective: explore non-traditional and emerging maglev-derived systems, assess the technical feasibility and effectiveness in Europe as well as demonstrate in relevant env. (TRL6)

Key activities:

- design concept of technical enablers and basic technologies supporting maglev derived systems (TRL3)
- test full functionality, performances and safety of an MDS in relevant environment (TRL6)
- Evaluation the technical and economical feasibility of the solution
- Identify the gaps and the potential topics for standardization on safety and security

Starting date: December 2025

Duration: October 2028 | Funding: 3M€

* Grant Agreement Preparation phase

Hyper 4Rail

Objective: facilitating the harmonization and interoperability of hyperloop technologies and analyse the technical and economical feasibility

Activities:

- Completed a network analysis & use-cases report including a CBA of a hyperloop network across the EU
- First business case for a route between Rome –Genoa –Marseille
- A first passenger-oriented concept of operation is under discussion with key stakeholders
- A first draft of system requirements is under review based on result on the concept for operations

Starting date: December 2024

Duration: November 2026 | Funding: 2.3M€

Exploratory Research

Exploratory Research: Progress in 2025

RAIL4CITIES

The project contributed to the overall goal to develop a new operational, readily available and highly applicable model of stations (Sustainable City Promoters (SCP) model), combined with a common European methodology and tool for its effective implementation. The project took inter-dependent impediments (profit-orientated business model, complex web of agents and stakeholders, policy gaps) into account and provides decision makers with the tools to transform stations into promoters of sustainable cities.

S-ROI tool available here: https://rail4cities.eu/

Starting date: July 2023

End date: June 2025 | Funding: 700k€

Project completed

ESEP 4 Freight

The project developed an interactive Web Platform to provide logistics information for relevant freight transport actors to enable the modal shift to rail: https://intermodal-railfreight.eu

An Impact assessment, scalability assessment and user handbook for the Web plarform has been delivered as well as business cases analysis for intermodal transport solutions.

Starting date: September 2023

Ended: August 2025| Funding: 1,3 M€

Project completed

LEADER

Learnings for European Autonomy to Deliver Europe's Rail in 2030

Objective: provide a forecast of the actual availability and gaps in the materials and components necessary to produce each of the innovations EU-RAIL is targeting for 2030, and make relevant recommendations for resilience to the EU Institutions and the European Industry.

Key achievement:

- Finalisation of analysis of all innovations planned in the EU-RAIL MP and MAWP under the point of view of 'what specific components and raw materials are necessary to produce them for the market'
- Key field visits to “Norsk Hydro” Aluminium plant in Belgium, to “KME” Copper plant in Italy, to “X-Fab” Silicon and Gallium-Nitride semiconductors plant in Germany, to discuss challenges around strategic raw materials and components

Starting date: July 2023

End date: December 2025 | Funding: 700k€

Exploratory Research: Progress in 2025

InBridge 4EU

Objective: to develop procedures to revise and enhance some of the normative criteria used to evaluate the dynamic performance of railway bridges stipulated in the Eurocodes and TSIs.

Key achievement:

- Dynamic train categories and key vehicle parameters identified.
- Simplified models completed for over 500 bridges to characterize critical typologies and dynamic behavior.
- New formulations improve the influence of moving loads and track distribution.
- Bridge damping study supports EN 1991-2 revision with refined structural classification guidelines.
- Ballastless decks and ballasted track bridge behavior with recommendations for acceleration and stability.

Starting date: September 2023

End date: August 2026 | Funding : 928k€2

DACcord

Objective: to enable an effective and coordinated European-wide DAC roll-out and setting up an actionable migration and implementation plan

Key achievements :

- Operative Management of the EDDP
- DAC migration roadmap refined and further developed with regular review of the collection of the European vehicle fleet data
- Regular follow-up of the overarching JU's DAC-related projects (FDFTO) risk management
- Continued with the actions decided in the EDDP stakeholder management planing
- Follow-up the EU-Rail Sounding Boards for and with the railway sector community on operational procedures and DAC technology

Starting date: April 2023

End date: March 2026 | Funding: 1.5 M€

Academics4Rail

Objective: to create tools for mapping research theme, establish a scientific observatory to identify gaps and future needs, deliver a KPI framework for assessing the performance of Europe Rail's programme and enabling 6 PhDs in Railway Engineering

Key achievements :

- Position paper on research gaps (notably in low-TRL, multidisciplinary, and interoperability studies) and catalogue of PhD topics mapping academic contributions to EU Rail priorities
- KPI assessment framework linked to societal impacts using an elasticity-based mode choice model.
- Progress in the research area of aerodynamics, electromagnetic compatibility, and wireless communications for trains, along with predictive maintenance and AI-driven driving assistance system

Starting date: September 2023

End date: February 2027 | Funding: 2 M€

Exploratory Research: Progress in 2025

SYMBIOSIS

Objective: to create a comprehensive strategy that bridges transport infrastructure and energy networks while incorporating biodiversity considerations

To provide solutions to enable infrastructure project developers to showcase the impacts and benefits of their projects to achieve environmental conservation and sustainable development

Key achievements:

- review of 102 environmental impact assessments (EIA) shows that biodiversity considerations are unevenly integrated across the infrastructure lifecycle.
- An online survey launched to assess habitat and biodiversity data collection practices across transport infrastructure.

Starting date: September 2024

End date: August 2027 | Funding: 2,8 M€

XCROSS

Objective: to develop a suite of integrated disruptive technologies which combine to provide a technological process for the monitoring, inspection, and maintenance intervention of crossing surface profiles, demonstrated in urban environment;

Key achievements :

- 3D Scanner: Initial lightweight prototype created with field tests conducted on several frogs.
- Digital Twin: Early-stage optimisation models developed to simulate reprofiling strategies.
- Augmented Reality: Prototype AR overlay functionality created for visualizing wear patterns.
- 3D Printing: First physical templates produced for use in on-site welding guidance.
- Monitoring System: HW/SW integration underway; sensors tested

Starting date: October 2024

End date: March 2027 | Funding: 2,7 M€

QuieterRail

Objective: to introduce a step change in predicting and mapping of railway noise and vibration, acceptance testing of new rolling stock, and promoting of cost-effective noise mitigation.

Key achievements :

- Noise in curves benchmarked and urban environment tests completed.
- Methodology for transposition advanced and freight wagon measurement data collected.
- On-board roughness measurement and rail grinding survey launched with responses.
- Life cycle cost use cases defined and noise tools benchmarked.
- Ground vibration prediction progressed with numerical study and impact model.
- Survey of available track, soil and building database performed. Hybrid vibration prediction tool under development

Starting date: October 2024

End date: September 2027 | Funding: 4,1 M€

Exploratory Research: Progress in 2025

PhDs EU-Rail

Objective: Realization of 10 PhD positions, teaming up with the industry; and continuous process for the extension of a rail excellence scientific community.

Key achievements :

- Progress achieved in rail innovation management, KPI assessment of research programmes, gender inclusion and education through tool development, stakeholder engagement and modelling.
- Advancements made in urban logistics, night train operations, bridge dynamics and safety communication with new models and initial testing.
- Development in socio-economic impact assessment, inclusive training protocols and validated ERTMS ICT platforms with AI/ML integration.

Starting date: October 2024

End date: September 2027 | Funding: 2 M€

NEXUS

Objective: To redefine metro adaptability to demand fluctuations, deliver a comprehensive feasibility study train control systems of tomorrow and explore promising of AI and data science applications in metro transport.

Key achievements :

- Assessment of the application of AI and data Science in future Metro operations
- Assessment of user and operator requirements and framework conditions
- Assessment of metro transport system models
- Assessment of cybersecurity threat identification and management for Metro operations

Starting date: October 2024

End date: September 2026 | Funding: 3.1 M€

DAC FIT

Objective: To deliver a fact-based assessment of the DAC retrofit readiness of freight locos & wagons, a fact-based DAC Retrofitting Capacity Assessment in Europe and a scalable and executable DAC retrofitting (capacity) plan.

Key achievements expected:

- Consolidated and harmonised data from various European vehicle registers and public sources, creating a consistent framework that enables DAC migration modelling
- Structured retrofitting processes were defined
- Europe-wide workshop database developed to assess and map retrofit capacities

Starting date: October 2024

End date: October 2026 | Funding: 1.5 M€

Q & A

Europe's Rail

Coffee Break

See you back at 11.10 am

Implementation of the EU-Rail Programme

System Pillar:
State of Play and Year 3 Results

Ian Conlon & System Pillar Core Group

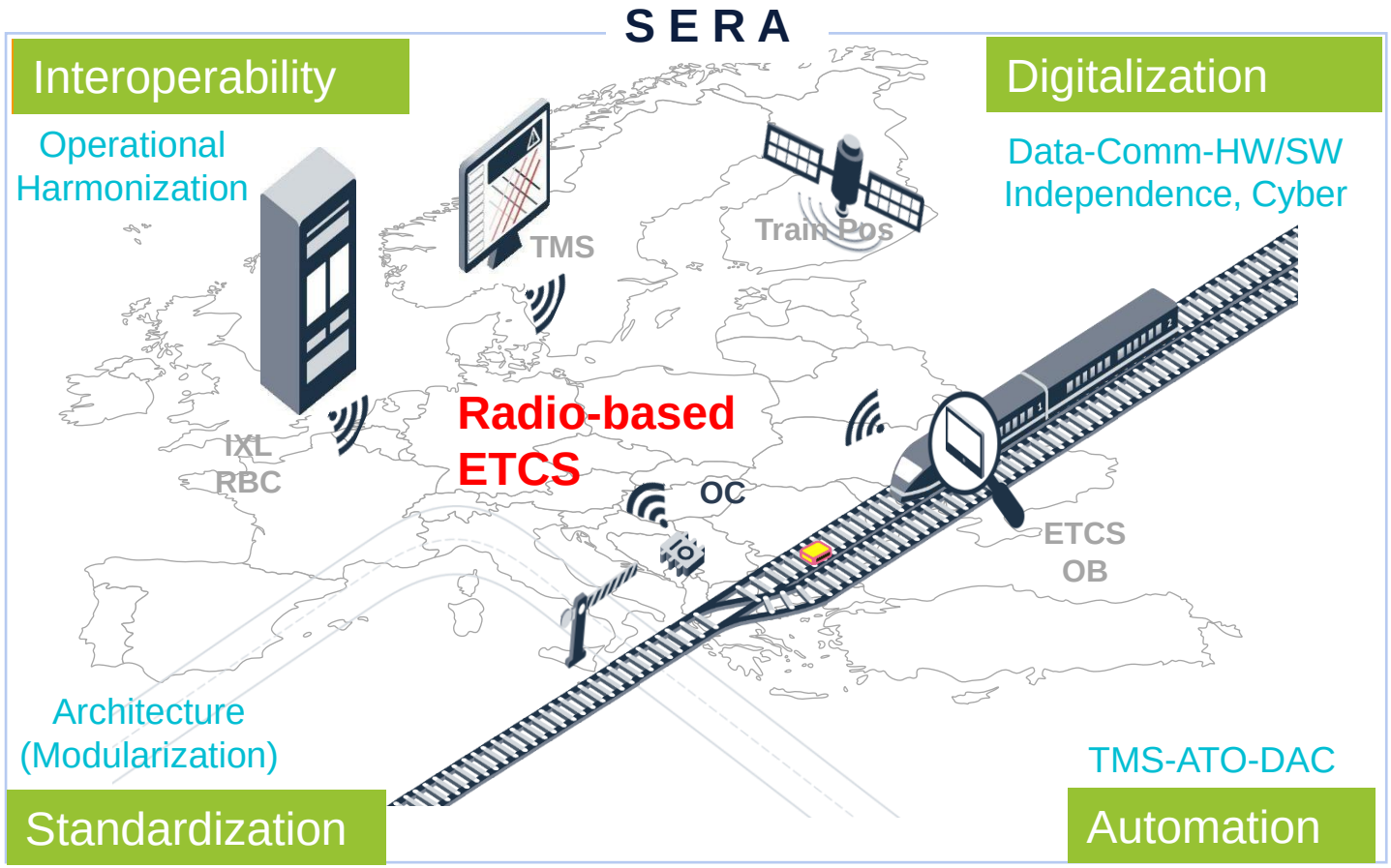
System Pillar – General Overview

EC, ERA, Member States, and Sector agreed on a dedicated structure - System Pillar - to provide a unique opportunity to allow the Rail sector to converge on a strategic vision for the evolution of the **Single European Rail Area (SERA)**.

MultiYear Program *(running 2022-2028)*

~ 400 *experts from Sector*

Front loaded funding *(remaining budget EUR 21m)*



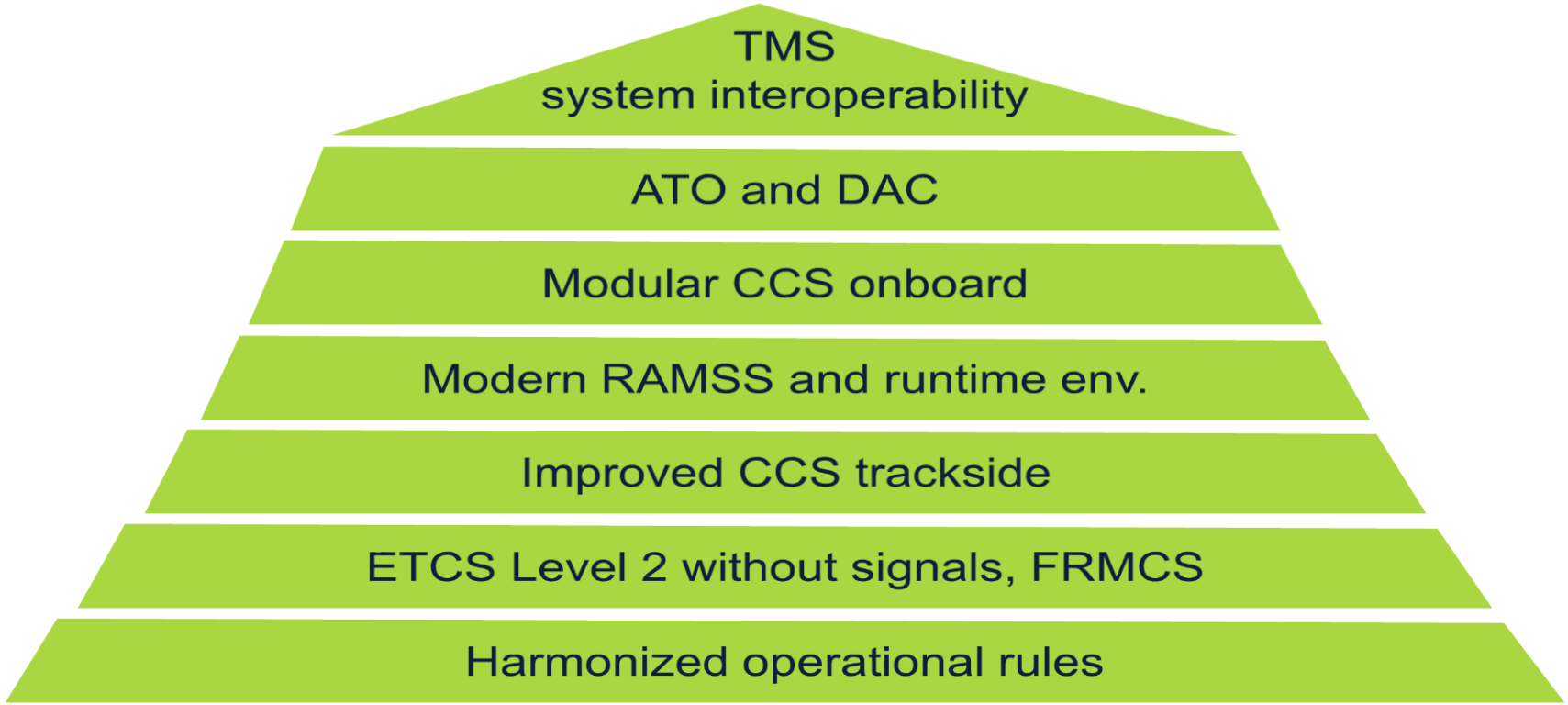
Why - The motivation for the System Pillar

Harmonize operations and products with a powerful and modular architecture.

Reduce process effort on all sides (products, assets, production)	Reduced cost
Accelerate product evolution by creating higher market potential per product	Performance, Capacity, Automation, Digitalisation.
Healthy and affordable product and asset lifecycles. Manage complexity and knowledge availability risks.	Healthy Business.
Improve interoperability	SERA.

What - System Pillar Scope

Harmonized operational rulebooks, off-the-shelf CCS products



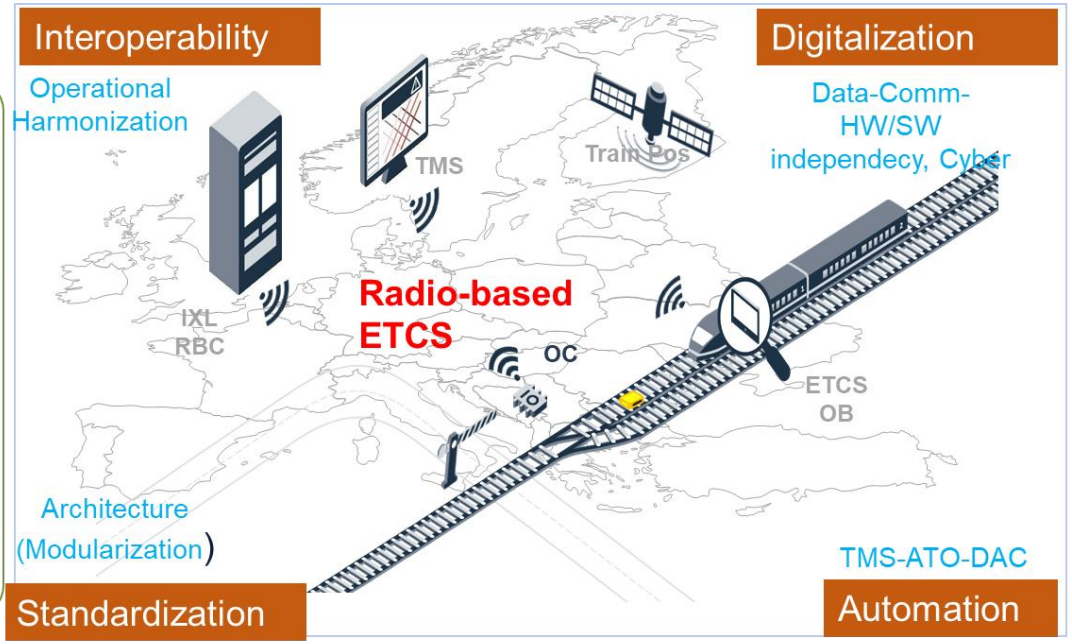
Outcomes of the System Pillar 2025

System Pillar

MultiYear Program

~ 400 *experts from Sector*

50 m *EU funded*



Deliverables can be found here: https://rail-research.europa.eu/system_pillar/

General
- ✓ The second version of the Standardisation and TSI Input Plan (STIP) was published
- ✓ TSI change request bundles submitted
- ✓ FRMCS V2 report approved

PRAMS and Security
- ✓ Modular safety case structure and EU hazard database
- ✓ Cybersecurity requirements and specifications

Task 1, Rail system
- ✓ To-be architecture for 1 capability

Task 2, Train CS
- ✓ Onboard modular architecture including Ethernet consist network, enhanced train interfaces, modularity, basic ASTP, multi display concept

Task 2, Traffic CS
- ✓ Trackside CS architecture design
- ✓ System specifications and interface of TPS, AEL and ATO trackside (Year 1 of 3)

Task 2, Operational harmonisation
- ✓ European harmonised operational rulebook (Year 1 of 3)

Task 2, Transversal CCS
- ✓ CCS/TMS data model based on extended ERA ontology
- ✓ Digital register and Diagnostics Data Model Specification
- ✓ Configuration and Maintenance management

Task 2, Trackside Assets
- ✓ Updated specifications approved

Task 3, TMS/CMS
- ✓ Interface TMS/Traffic CS (update)
- ✓ Integration TTR messages
- ✓ Cross border variants analysis CMS/TMS

Task 4, DAC/FDFTO
- ✓ Operational standards
- ✓ Central instance for data and software management

Task 5, HERD
- ✓ Demonstrator specification for pilot implementation
- ✓ 2 use cases for harmonised diagnostics were analysed

Highlights

Trackside architecture

Trackside architecture

Trackside architecture for ETCS L2 target system

PRAMS and Security
- ❑ Modular safety case structure and EU hazard database
- ❑ Security requirements and specifications

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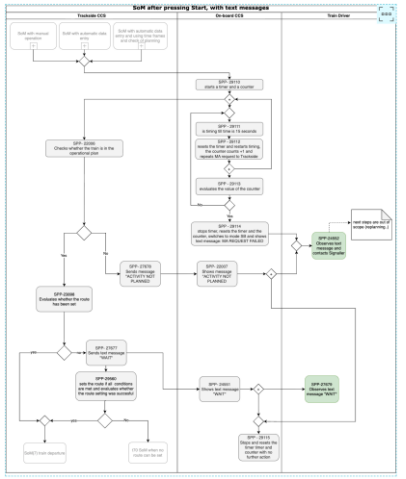
European operational rulebook

Recap: Design Targets

Simplified pure ETCS L2 system without legacy functionality, generic product safety case	Less system effort
Integration of trackside and onboard localisation, capitalizes integrity/length information (if available per train), supervised manoeuvres, no signals	Efficient, scalable and reduced amount of trackside assets
Precise and dynamic traffic flow management supported. Short train ahead times supported.	Better use of physical capacity, or less infrastructure needed
Reduced pre-configuration needs, self-adapting traffic control.	Less engineering effort
“Mixed” vehicle abilities on the same line allowed concerning integrity and length reporting	High flexibility for vehicle and infrastructure migration
ETCS L2 can be fully controlled on TMS level. Fixed block, fixed virtual block or moving block operations possible on TMS level.	Free choice of traffic management philosophy

Progress in Operational Harmonization

From concepts to one European operational ruleboook



- ❑ Basic operational principles defined
- ❑ Detailed structure of the “European ETCS Level 2 Rulebook”
- ❑ Detailed process design:
  OD Release package 1 and 2 (published in SP Release ESPR 1.0)
  - ❑ Analysis of existing national rulebooks or project work
  - ❑ 25 (of 120+) harmonized operational processes drafted
    - ❑ Operational requirements
    - ❑ Detailed process flow, activities, pre- ad prost conditions
    - ❑ Derived system needs

Highlights

Onboard architecture

Traffic CS design proposal

Onboard architecture

Onboard architecture based on modularity and standardised interfaces

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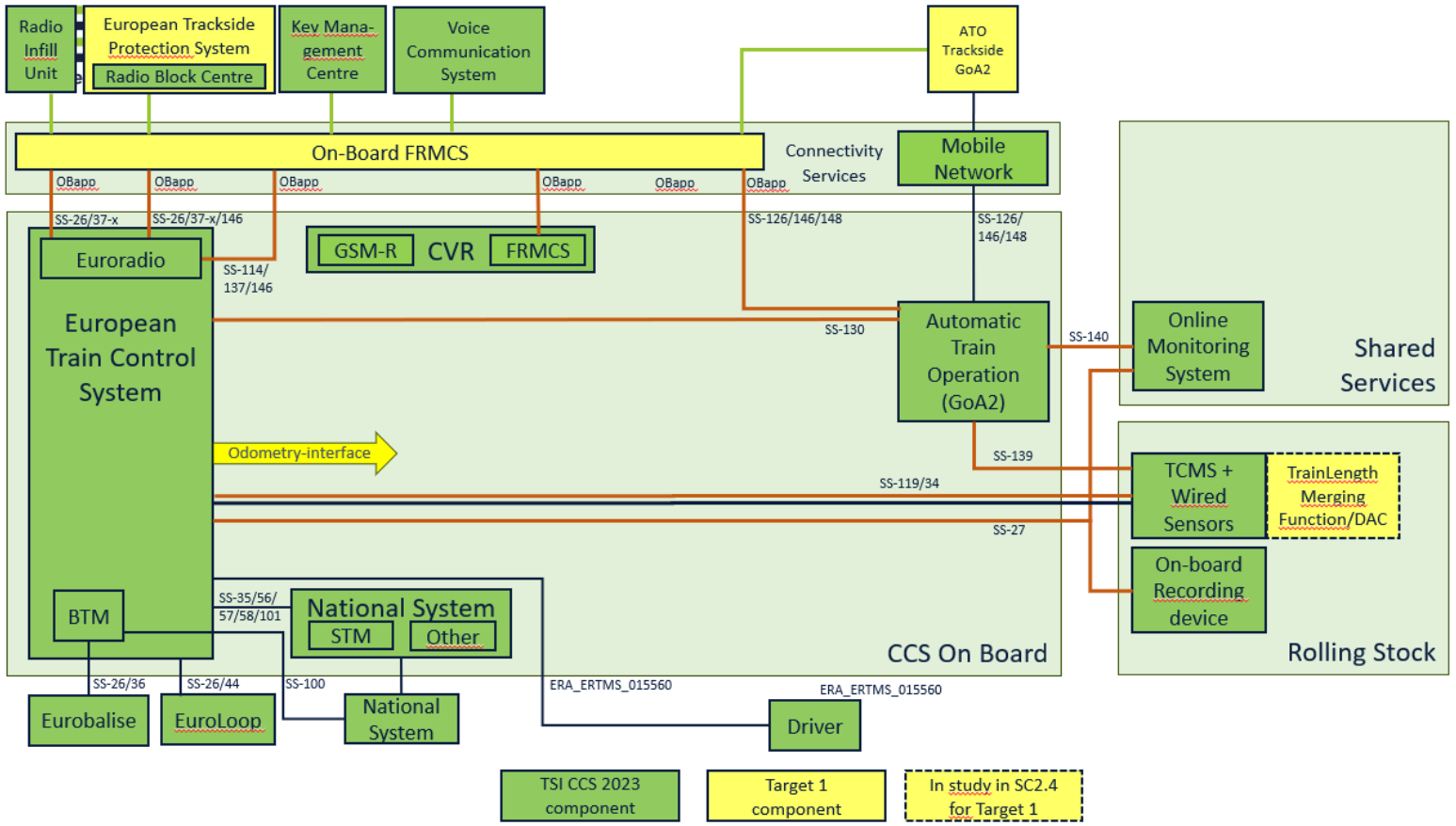
European operational rulebook

Onboard architecture for Target 1

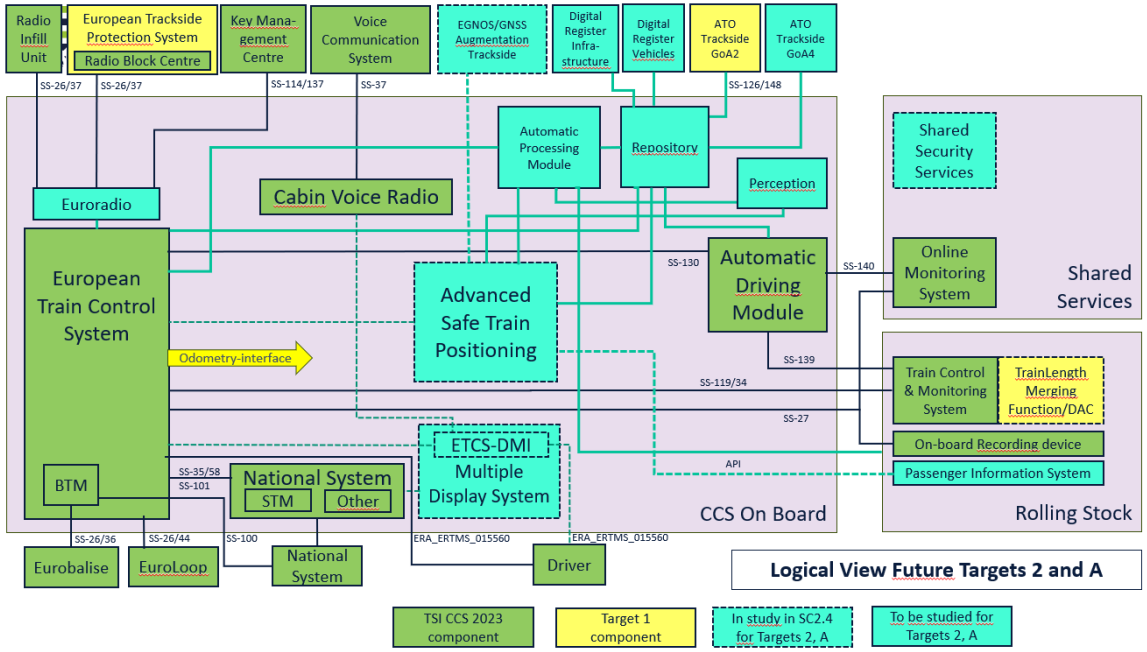
Definition of an on board architecture based on a higher modularity to pave the way for future enhancements

- Introduction of higher modularity with the definition of the Ethernet consist network (SS147) leading to improved connectivity and easier upgradability
- Consideration of FRMCS as well as Train Length / Train Integrity determination especially for DAC
- Definition of an Odometry interface to allow for improved and testable performance and robustness



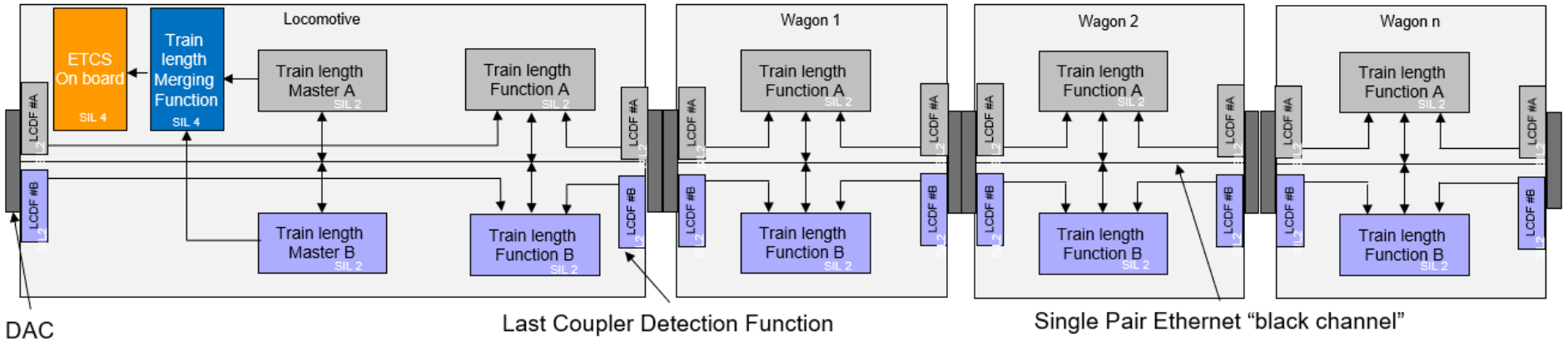
Future Work of the Train CS Domain

- Creating the CCS onboard architecture with different migration steps providing the overarching strategic view
- Considerations on updateability and upgradeability will be analysed as key to enable deployment and migration
- Analyzing the requirements from the SP Cybersecurity guidelines
- Definition of a harmonized implementation considering especially the Cybersecurity Services which might have a larger impact

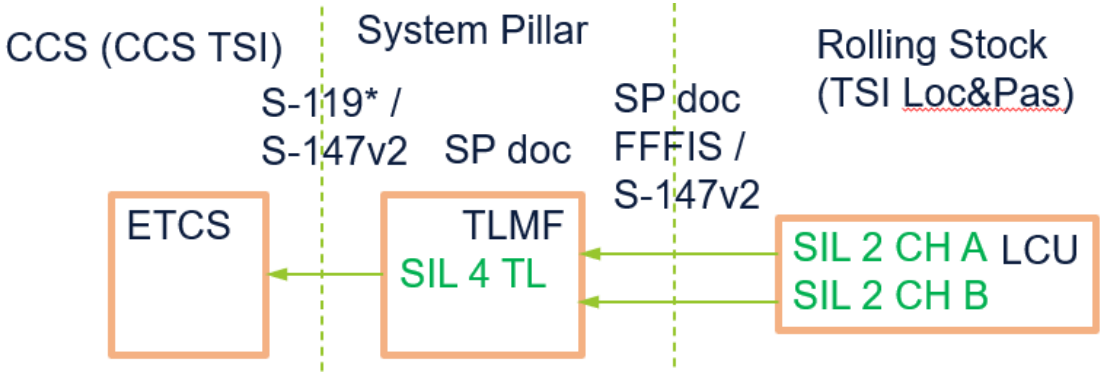


Train Length / Train Integrity Determination for Freight Trains with DAC

- A system based on two independent SIL 2 channels installed on all wagons as part of the DAC will deliver the necessary information to enable Hybrid Train Detection and Moving Block for freight trains

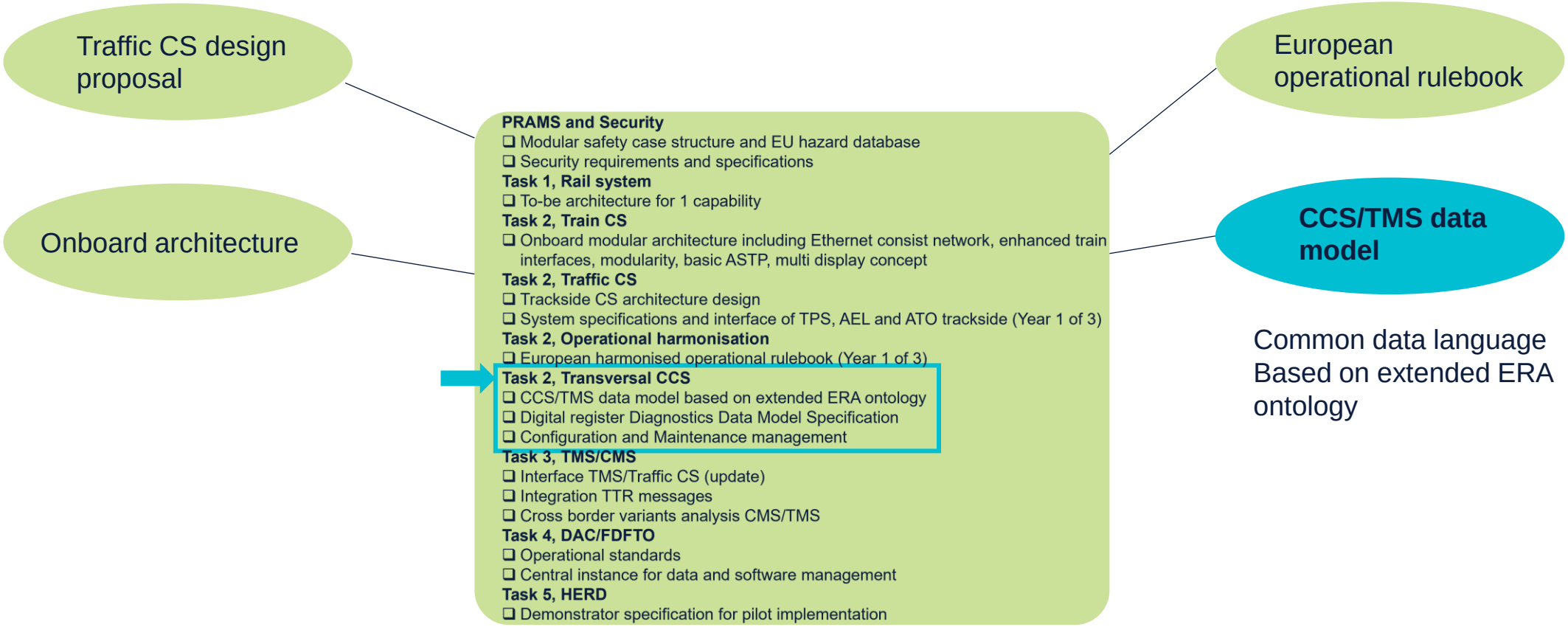


- The two channels will be merged within the so-called Train Length merging function (TLMF) to derive the required SIL 4 quality needed for ETCS
- The specification of the TLMF will be first a System Pillar Document to be later integrated either into the CCS or Loc&Pas TSI



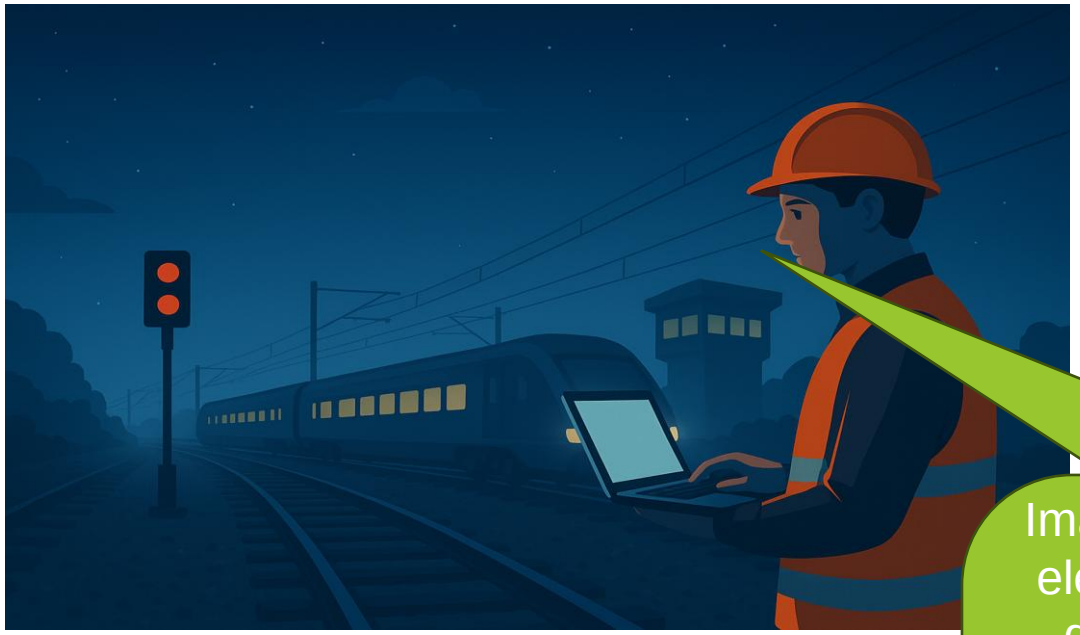
Highlights

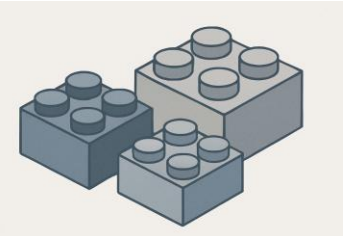
CCS/TMS Data model



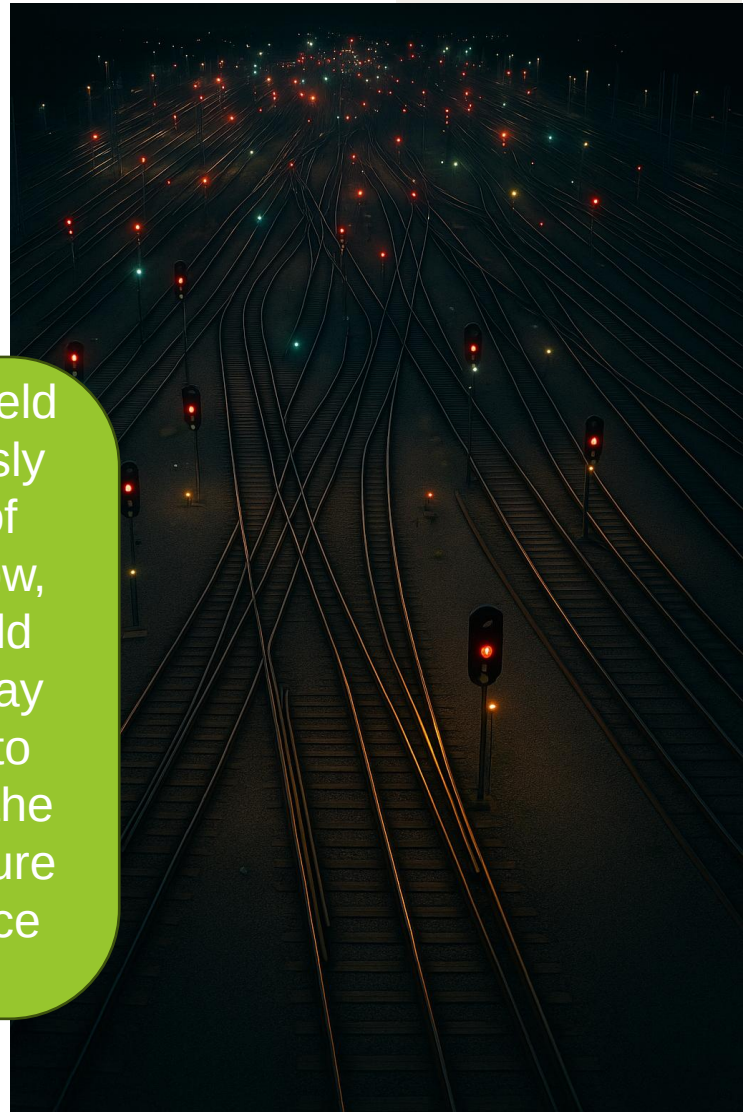
Common data language
Based on extended ERA ontology

Use Case: Simultaneous update of field elements





Today, software update (config) is done locally in the field on each asset/ train!

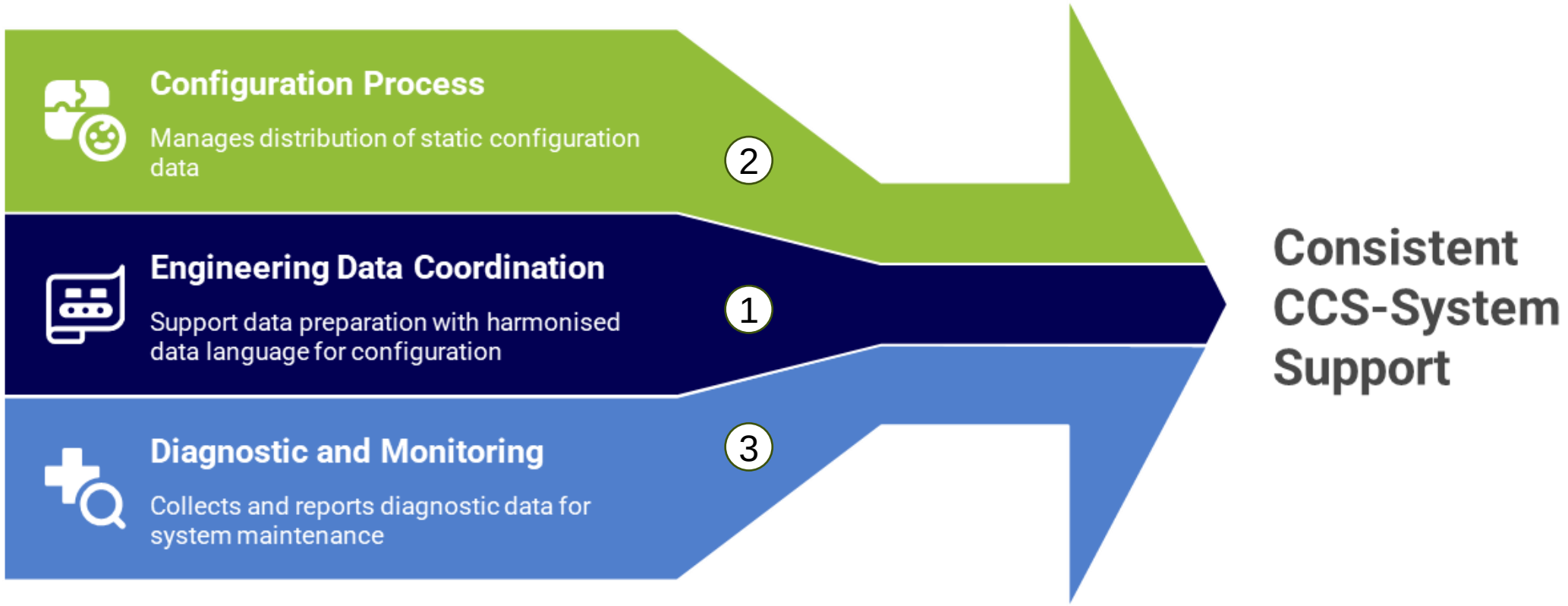


Imagine updating hundreds of field elements or trains simultaneously during night in a 2 hours slot of paused railway operations. Snow, fog, mist, thunderstorm and cold temperature. Hundreds of railway maintenance workers walking to "their" asset for local update in the field. Do you think this is the future of rail? How will the maintenance colleagues think about us?

Tomorrow, cyber requires quick intervention. Centralised auto-mated configuration is the only way forward. **We pave the way!**

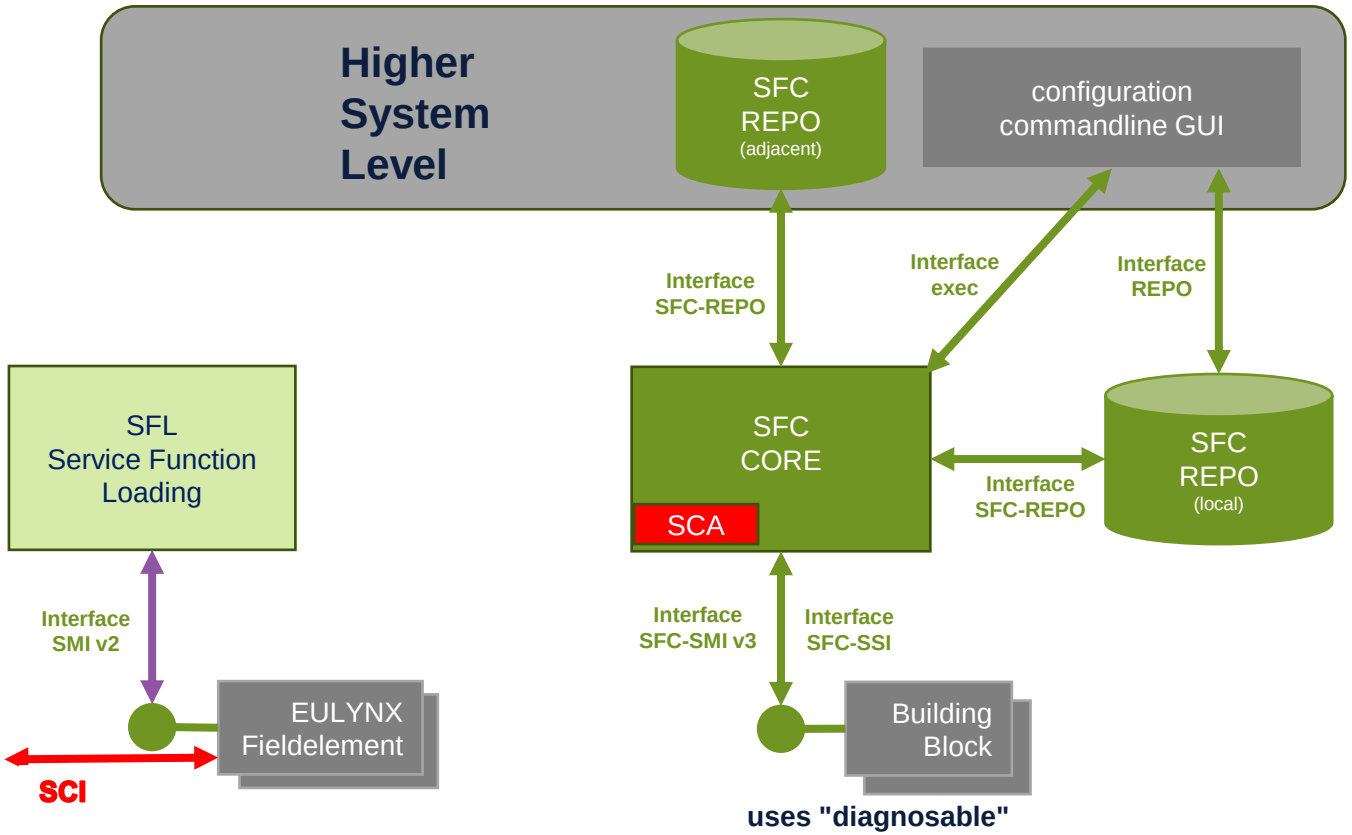
E2E data process is essential part of CONEMP

ConEmp defines the transversal support functionalities/services within the CCS-System covering standardised service functions and interfaces. Its main functional areas include the configuration process, engineering data, diagnostics & monitoring, and the provision of transversal support across subsystems.



Configuration Process evolution

SFC: Service Function Configuration
SCA: Safe Configuration Authority
SCI: Standard Control Interface
SMI: Standard Maintenance Interface

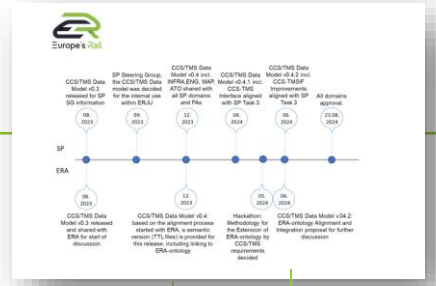


Criteria	SMI v3 – Config Management
Scope of Application	Fieldelements, Traffic CS BB, RBC, Interlocking, Rolling stock
Safety related Configuration (with Commit)	✅ SMI v3
Interlocking does not need to update if a field element gets a safety related update	✅ Dependency Tree
Scaling on application: multiple 100 devices simultanously	✅ Configuration Repository
Dedicated management of dependencies possible (order of installations)	✅ Dependency Tree
Standardized storage Configuration Repository	✅ Configuration Repository
Field elements continue in operation for not safety related updates like cybersecurity updates	✅ Separation of safe and non-safe

V1 Testing required!

Test Configuration Process also in trains!

Overview Milestones



SP

08.2023

CCS/TMS Data Model v0.3 released for SP SG information

26.10.2024

Publication of CCS/TMS Data Model V1.0

21.03.2025

Publication of ERA-extended-ontology and derived CCS-TMS Data Model (Version 1.1) for demonstration and collaboration with Innovation Pillar

06.2025

SP STG information on EU-RAIL internal publication

09.2025

EU-RAIL V1 internal publication

09.2026

SP STG

EU-RAIL internal publication update

09.2027

SP STG decision on unrestricted publication

ERA

08.2023

CCS/TMS Data Model v0.3 released and shared with ERA for start of discussion

26.10.2024

SP STG Decisions N° 3 & 4/ 2024

01.04.2025

Publication of ERA-extended-ontology and derived CCS-TMS Data Model (Version 1.1)

09.-10.09.2025

TCCS Tutorial Workshop in Berlin

2023 **2024** **2025** **2026** **2027**

Highlights

Cybersecurity

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European operational rulebook

CCS/TMS data model

Cybersecurity for rail

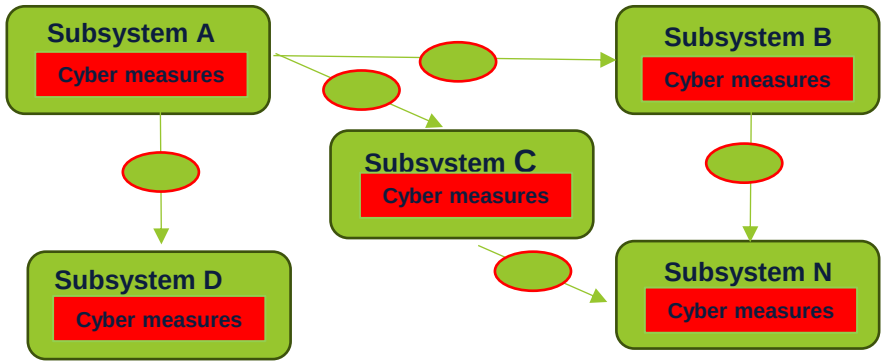
Railway specific implementation of general cybersecurity principles

Cybersecurity in System Pillar

- Cybersecurity is becoming more and more relevant in our modern environment.
- Primary goal of System Pillar is to design and specify the future target Railway System where the keywords are **Harmonization, Modularization, Interoperability**. The question is: How to address the Cybersecurity to guaranty the right protection against cyber attacks?
- The proposed solution by System Pillar Cyber Domain is based on:

  - '**Cyber by design**' means embedding the cyber measures specified in all component/products/subsystem composing the railway system. **Cyber measures are intrinsic to the Product/Subsystem**.

  - An '**Open**' Cyber architecture- easy to evolve in the coming year to assure cyber protection against future threats- e.g. more powerful computers (e.g. Quantum Computers).



Achievements and Next Steps

Achievements

- **Documents specification delivered and published**
  1. **Secure Component Spec**: define the Component requirements for Cyber (Guideline)
  2. **Shared Cybersecurity Service Spec** (Interoperability relevant) : Specify the agreed 'SW services' to be implemented in the component to assure protection and interoperability.
  3. **Secure Communication Spec** (Interoperability relevant) : Specify the agreed communication methods to assure protection and interoperability.
  4. **Security Program Requirements (Application Guidelines):** Specify the Cyber relevant processes requirements

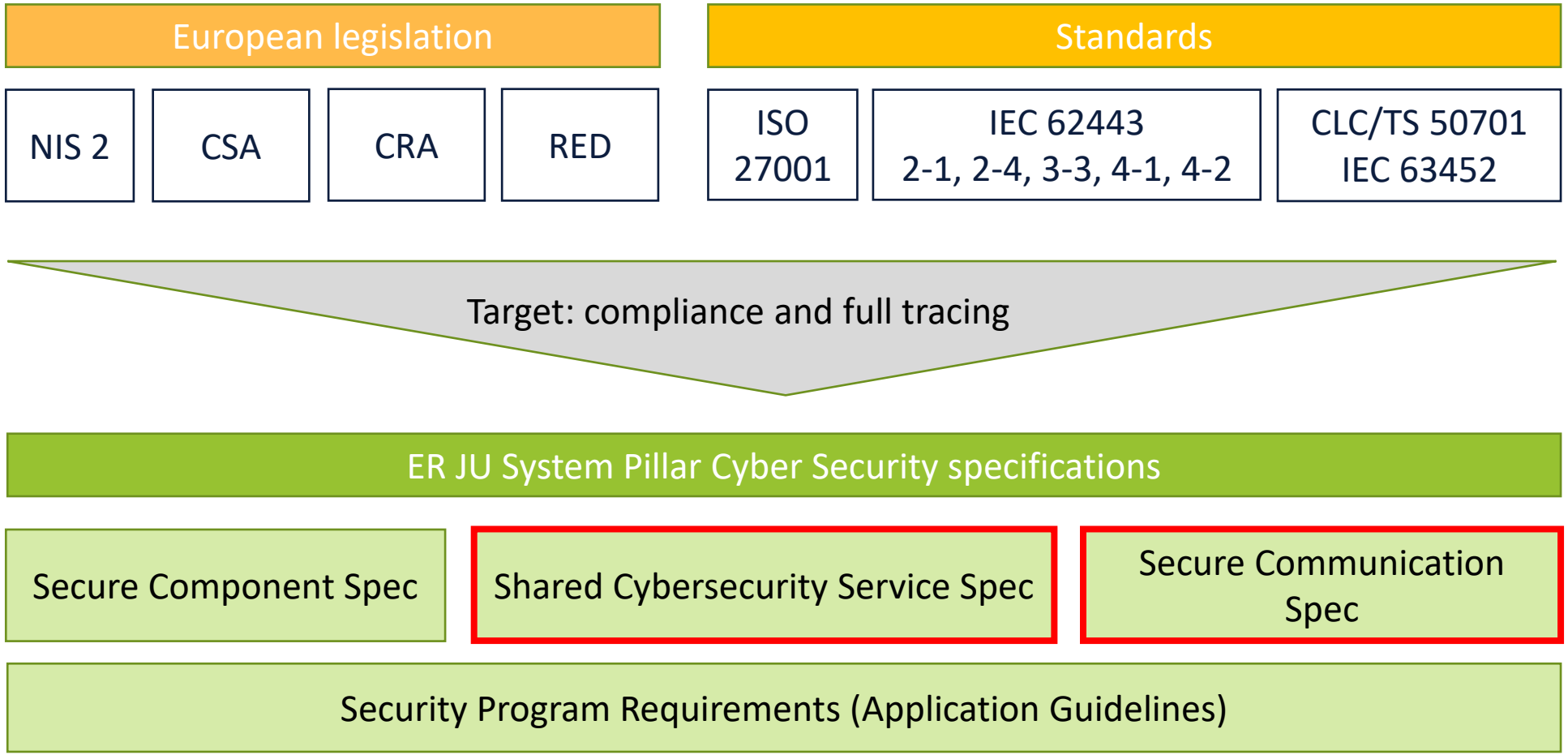
Link: https://rail-research.europa.eu/wp-content/uploads/2025/03/ERJU-SP-Cybersecurity-Specifications-V1.0.zip

- **TSIs Gap Analysis:** Applicability analysis and gaps identification on CCS, ENE, Telematics, OPE TSIs.

Next Steps (On Going):

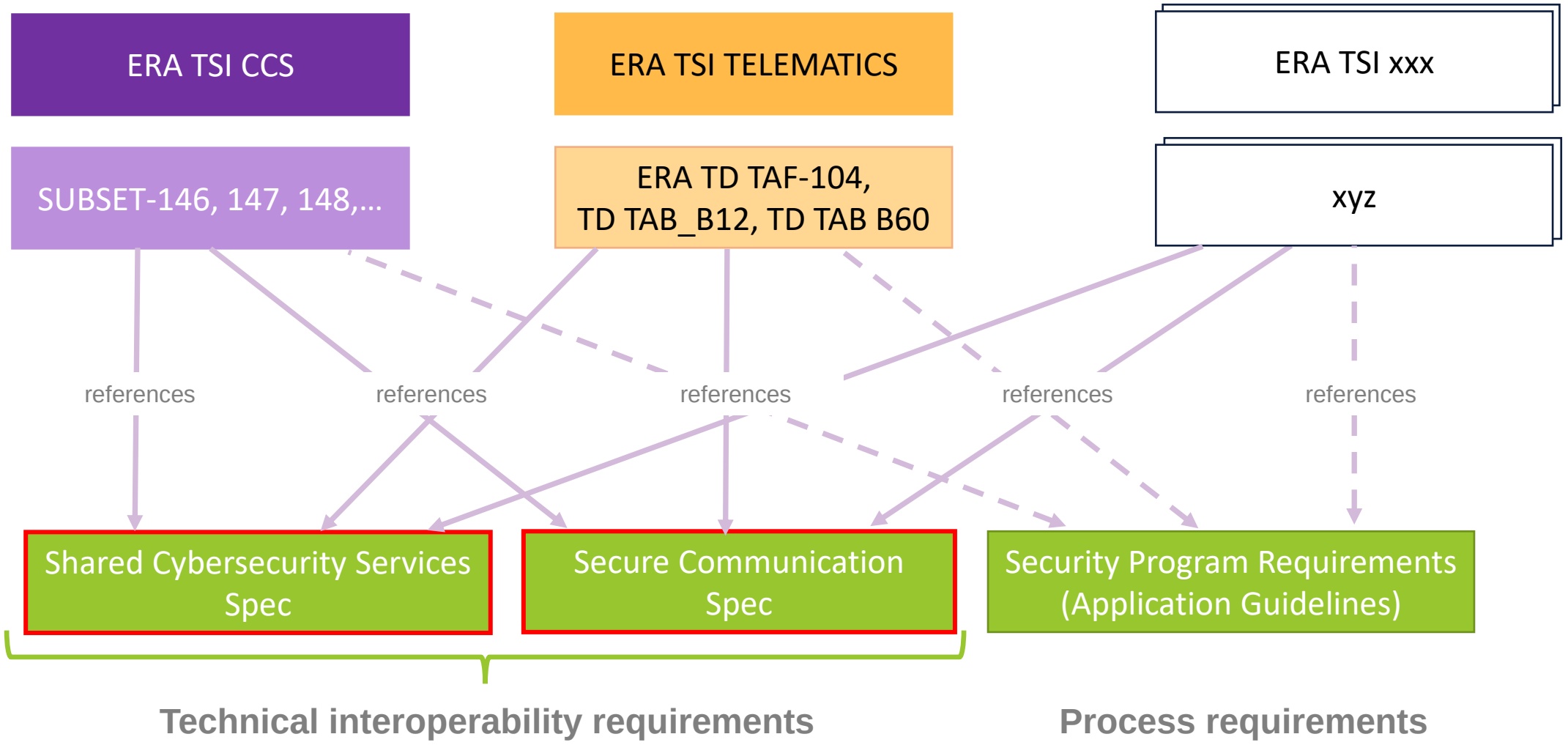
- Definition of the TSIs Changes needed to guaranty the Interoperability in collaboration with ERA.
- Issue the EU Recommendation for Cybersecurity by end 2026.

European Security Compliance



Red circled box are Interoperability (TSIs) relevant.

TSI update with cybersecurity requirements



Conclusion

- Cybersecurity Requirement Specification mapped on EU Standards and Legislation mapping: Done
- TSIs Gap analysis first analysis: Done
- TSIs Change Request and solution proposals: On Going

Q & A

Implementation of the EU-Rail Programme

Preparing Deployments: Deployment Group and EDDP

Karel van Gils & Mark Topal-Gökceli

Why focus on Deployment

bridging the "valley of death" between R&I and commercial operations

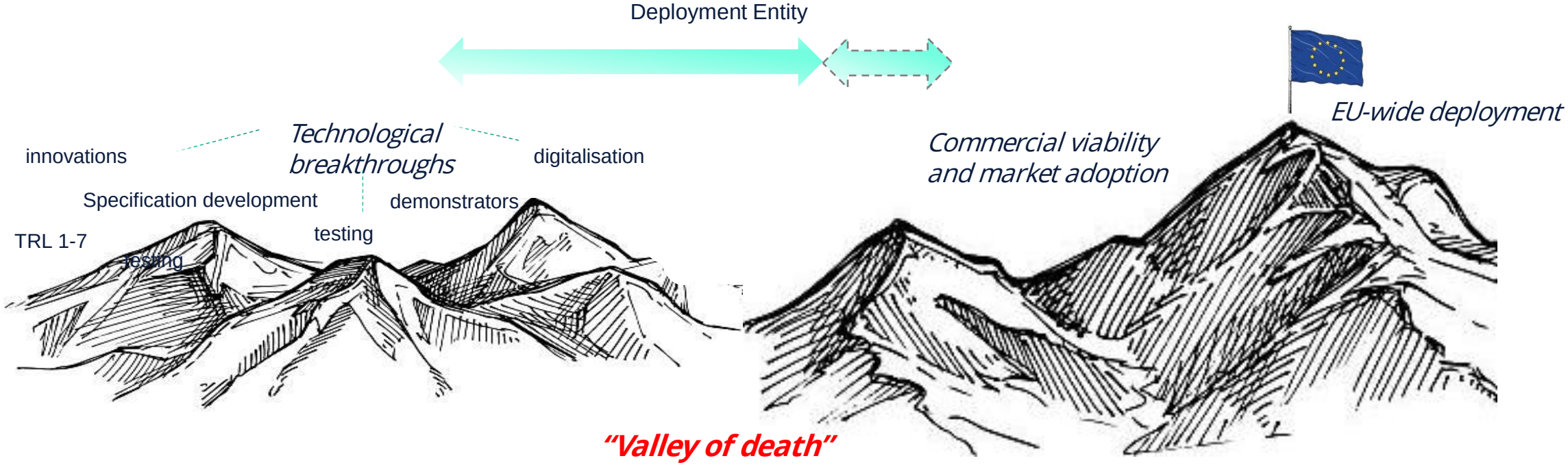
EU-Rail High-Level Deployment Group

FROM…

The realm of
Research and Innovation Programmes

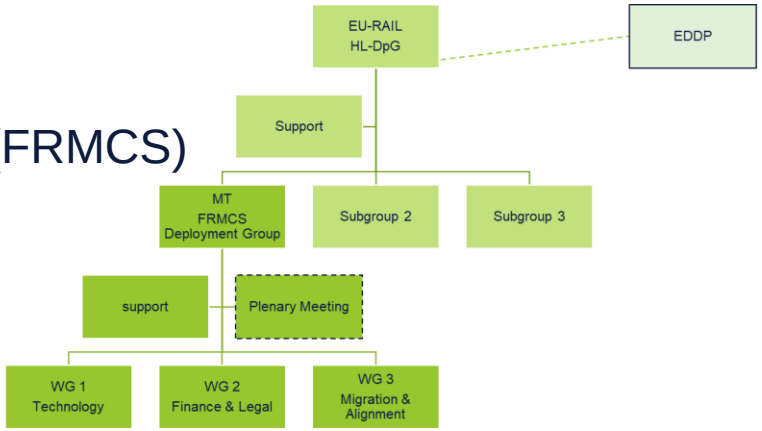
TO…

The realm of
Commercial Operations



1. High-Level Deployment Group (HL DpG)

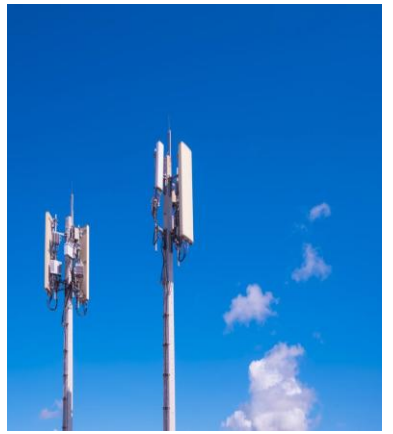
- To accelerate, ease and cost-effective implementations of innovations and new architecture, including Innovation- and System Pillar outputs
- Open stakeholders group – to apply please have a look on our website: https://rail-research.europa.eu/participants-deployment-group/
- Formalised in 2025 with 25 participants and 2 members (Axians, ProRail) applied this year
- From process oriented to first analyses and recommendations
  - Focus on Future Railway Mobile Communication System (FRMCS)
  - Alignment with EDDP programme
  - Study on alignment large sector programmes
- 3 Meetings in 2025



2. Focus on FRMCS

set up FRMCS European Deployment group

FRMCS European Deployment Group



Provide advice and recommendations to the HL DpG and sector on the best way to deploy FRMCS (business driven: cost efficient, simple, fast)

Deliverables

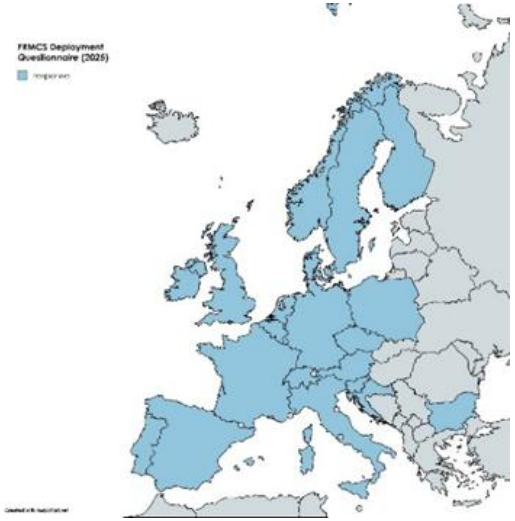
- Analyse and estimate Infra, rolling stock, industry and workshop capacity for deployment
- Support to accelerate and simplify authorisation
- Perform cost analyses, CBA and risk assessments
- Develop toolbox with diverse migration scenario's (greenfield and brownfield situations)
- Provide cross-border (installation) alignment and public-private mobile network interface analyses
- Alignment with other major Rail programmes (ERTMS, DAC, …) and stakeholders

- Implementation programmes are and stay responsibility of RUs/IMs/lessors and Member States (inclusive financing).
- Based on broader context: Development specifications: UIC programme; Test programme: FP2-MORANE2; EECT process: ERA; Standardisation: ETSI
- EU-Rail System Pillar Radio report 2.4 finalised and agreed as basis for scope, timeline and governance

FRMCS Deployment survey (questionnaire)

FRMCS European Deployment Group

- EU-RAIL FRMCS Deployment Group conducting a survey to gather sector information regarding the FRMCS deployment activities and to create more awareness in the sector about the upcoming big transformation.
- With the support of several associations, the questionnaire has been distributed, and 66 answers have been received.
- The distribution of respondents:
  - 19 Infrastructure Managers from 19 countries,
  - 26 Railway Undertakings from 12 countries,
  - 5 Trackside Providers,
  - 5 Onboard Providers,
  - 11 NSAs from 11 countries.
- The respondents are from 20 different countries (including UK, Switzerland and Norway)



* Full report and analyses available on EU-Rail website.

Questionnaire - Key points (summary)

Will be used as input for further analyses in Working Groups and for ERA Technical Opinion recommendation #6

FRMCS European Deployment Group

1. Most of the Infrastructure Managers intend to use MNO and there are multiple intended ways of using RMR and MNO.

2. There is globally no financing plan.

3. Infrastructure Managers' schedules and Railway Undertakings' schedules generally do not match. We note very little awareness of the FRMCS deployment in great parts of the Railway Undertakings (e.g. smaller companies)

4. Deployment will not/is not foreseen to be completed before the 2040 deadline in several countries. Despite global obsolescence and fade out of 2G technology, railways are still deploying on new (TEN-T) and retrofitted lines.

5. Railway Undertakings are expecting more than "GSM-R replacement''. The future proofness of FRMCS shall/must be considered because of business economic reasons.

6. There are significant concerns about availability of resources and competences for the deployment.

7. IM's and RU's wait for TSI before starting Request for Quotation processes.

Analyses and recommendations (1/3)

state of play Working Group on Deployment technology

FRMCS European Deployment Group

First report delivered: Deployment Status Report V1.0*

- Status Report Deliverable based on Infra managers, UIC inputs and National Implementation Plans (NIP – 2024)**.

- Provides details country-by-country of FRMCS deployment plans including
  - ETCS integration, Routes planned, Timetable, numbers of on-board equipment

Next step on Cross-Border and MNO Landscape Report:

- Questionnaire shows wide interest in utilizing MNO for FRMCS. What does this mean for deployment in Member States / RU's, IM's, leasing companies

- Further analyses on for example Cross-Border considerations when network transition starts from an MNO national roaming scenario, or vice versa

* Full report available on EU-Rail website.

** Considering the sector has progressed in time and knowledge, information provided in NIP can be altered and/or changed.

Analyses and recommendations (2/3)

state of play Working Group on Finances and Legislation (WG2)

FRMCS European Deployment Group

Analyses on on-board cost drivers identified

- 45% to 70% of total deployment on-board costs are caused by certification, ESC*, RSC and authorization processes incl. CTT** as well as immobilization of vehicles
- “Overhead” costs higher then implementation costs itself

First proposals for adapting authorisation process Involving European players and authorities

- Reducing the number of prototypes by applying generic approaches
- Simplify certification and conformity processes
- Further ideas currently under (internal) discussion (e.g. Automated CTT process, simplify (single) assessment components (prima facie) and analyse legal topics (e.g. Art. 21(12) (EU) 2016/797 for authorisation FRMCS voice only)

Seven cost drivers have been identified *(proposal)*

1. **On-board equipment**
   Products, engineering, cabling, workshop (based on GSM-R)
2. **ESC and/or RSC costs**
   As a part of the whole certification process
3. **Other certification costs**
   E.g. conformity checks by assesment bodies
4. **Authorisation process**
   External + applicant internal costs
5. **Percentage of prototypes**
   Number of different types per fleet of 100 trains
6. **Authorisation for Placing of the Market**
   Validated by Conformity To Type
7. **Cost of immobilization of vehicles**
   Vehicles out of operation during these processes

* ESC: ETCS System Compatibility; RSC: Radio System Compatibility
** CTT: Conformity to Type

Analyses and recommendations (3/3)

state of play Working Group on Deployment Scenario’s (WG3)

FRMCS European Deployment Group

Toolbox of key migration scenarios incl. vehicles, trackside, operational and handhelds aspects

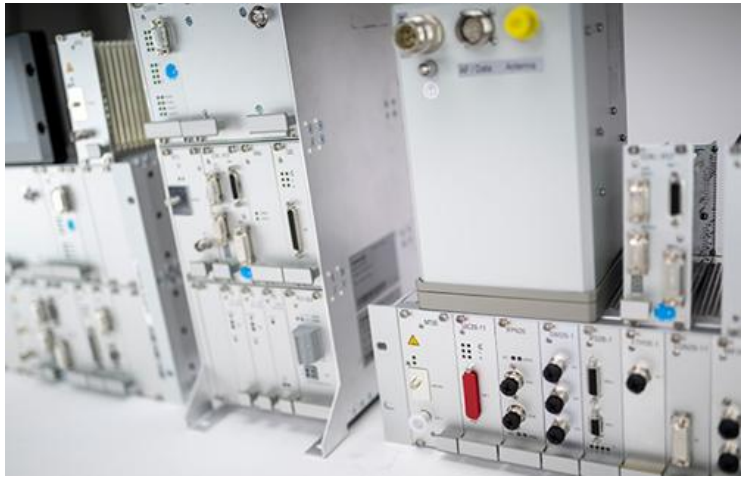
- Parallel operations with existing GSM-R and FRMCS dedicated networks
- Parallel operation with existing GSM-R and FRMCS dedicated networks and Public Network operator (Hybrid)
- Parallel operation with shared FRMCS infrastructure
- Existing GSM-R network migrated to FRMCS based on Public Mobile Network Operator(s)
- FRMCS greenfield deployment
- Handheld migration scenario’s

Report ready Q1 2026 (readable and accessible for non-experts)

Next steps FRMCS European Deployment Group

FRMCS European Deployment Group

- Ongoing stakeholder management with UIC, ERA and associations.
- Create better awareness and pro-active attitude towards FRMCS deployment topics
  - Small companies and Member States
  - Broader communication
  - 4 sector Webinars
  - Newsletters, conferences
- Next step in detailing cross-border/MNO analyses, cost-drivers, authorisation proposals and development scenarios
- second FRMCS Deployment questionnaire (mid 2026)



European Freight DAC Delivery Programme

enabled by Europe's Rail

Moving European Rail Freight Forward

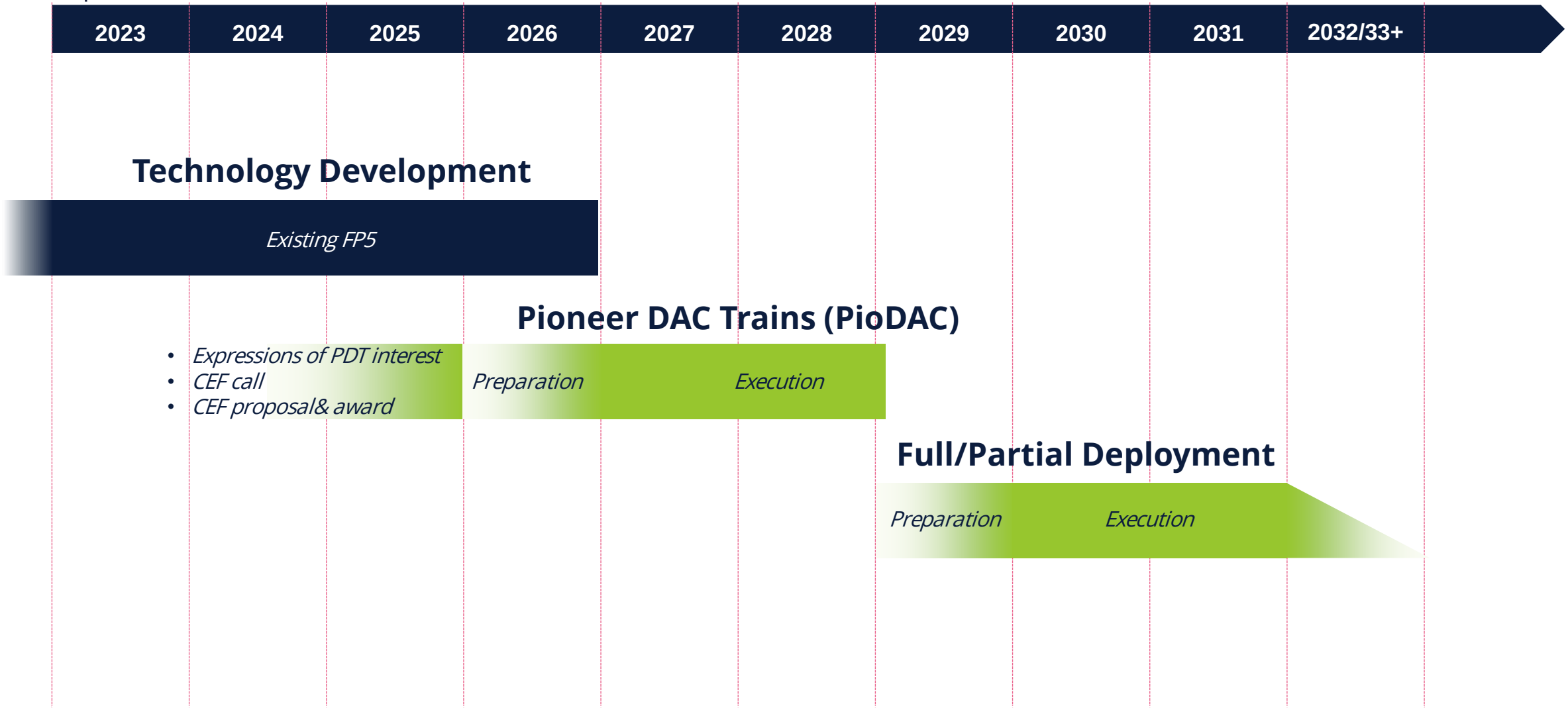
EDDP in 2025

Shifting further from…

…***R&D*** to ***Implementation***
…***Concept*** to ***Reality***
…***Technology*** to ***Business Case***

Our main focus:
fulfilling the preconditions for DAC deployment

EDDP as a programme in 3 major phases



Biggest success of EDDP: bridging the “valley of death” between R&I & commercial operations

FROM…

The realm of Research and Innovation Programmes

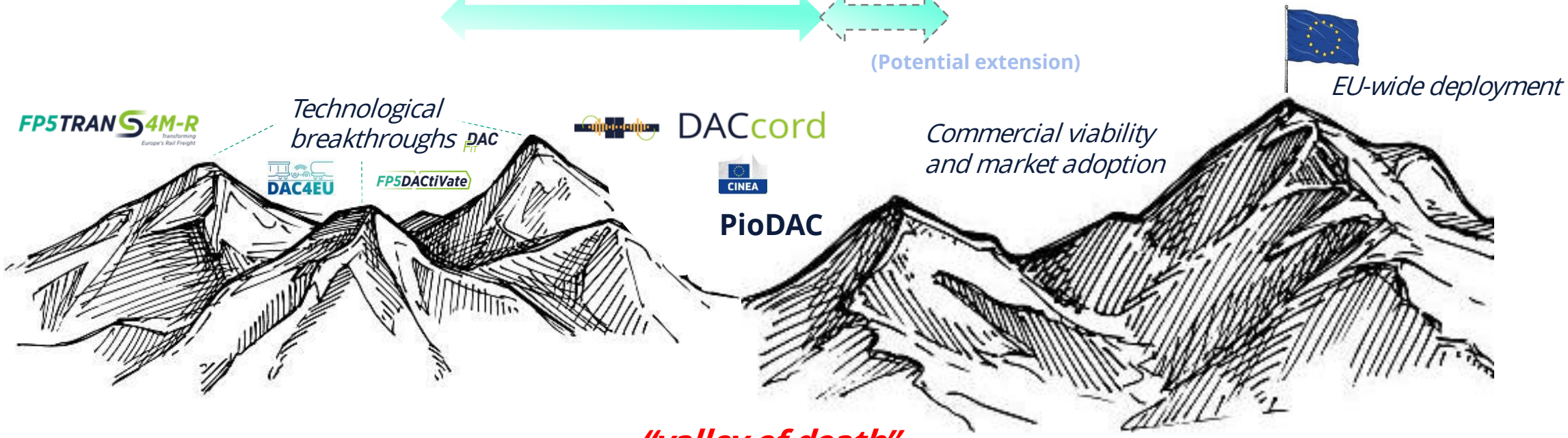
…TO

The realm of

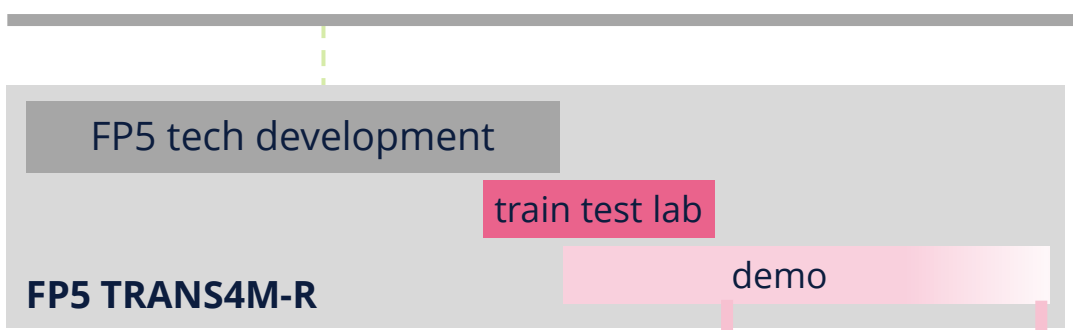
Commercial Operations

EUROPEAN DAC DELIVERY PROGRAMME
Enabled by Europe's Rail

(Potential extension)



Stepwise de-risking and ensuring a seamless link between FP5 and Pioneer DAC Trains



Pioneer DAC Trains (PioDAC)

DAC suppliers

	Step 1	Step 2
Functions in commercial operation	**core part**: mech/pneu/elec coupling, manual emergency uncoupling, power supply, data comm., on-wagon push-button uncoupling	**All functions** (for a significant time)
Functions for demons-tration	"**assist functions":** train comm. network uncoupling, train composition/ wagon order, automated brake test, train integrity/length Manual processes remain active, assist functions used under guided operation w/o safety implications, systems actively gather data for authorisation in Step 2	
Authorisation	with all components mounted	with all components in operation
Interoperability	for coupling functions (mechanical, pneumatical, electrical)	cross-vendor for all functions

2025 main FDFTO / EDDP achievements

	Q1 2025	Q2 2025	Q3 2025	Q4 2025
TECHNICAL DEVELOPMENT (DAC BASIC PACKAGE)	Closing of open points in DAC spec (DAC, Data and Energy, Train Functions)	Functional testing of communication and power supply systems finalised interoperability lab testing of comms systems & loco power supply		Train function testing by suppliers finalized. Interoperable communication system testing started Finalisation of RAMSS spec until end of 2025
		Continuation of **demo activities** (SE, CH)		ramping up demonstrator trains (AT, DE, IT, SE)
	major input to CEN/CLC standardisation works (mechanical / electrotechnical requ.s & test methods)			
			Bridging FP5 & PioDAC (“tiger team”) & overall FDFTO etc. risk management (via EDDP)	
PIONEER DAC TRAINS PDT	Pioneer DAC Trains CEF proposal	Pioneer DAC Trains CEF project award	PioDAC CEF Grant Agreement	PioDAC Trains Preparation starts
MIGRATION			Further progress on fleet analysis (EU-Rail project DACFIT)	
FUNDING INSTRUMENTS & POLICIES	Pioneer Train funding ensured (EC/CINEA)			

Outlook on all core activities

	Q4 2024	2025	2026	2027
TECHNICAL DEVELOPMENT (DAC BASIC PACKAGE)		• **Completion of the Technology Development in EU-Rail FP5 (DAC BASIC PACKAGE)** • **Ramping up demonstrator trains from EU-Rail FP5 (in Austria, Germany, Italy and Sweden)** • **Moving forward with standardization works (CEN, CENELEC, TSI, etc.)**		
PIONEER DAC TRAINS PDT	Pioneer DAC Trains preparations to secure funding	• **Pioneer DAC Trains CEF project award (PioDAC)** • **Preparation of the Pioneer DAC Trains**		• **Pioneer DAC Trains operation** • **Ensuring 2-step DAC Basic Package delivery on the part of industry**
MIGRATION		Further progress on fleet analysis (as part of EU-Rail project DACFIT)		Solving further obstacles for full DAC deployment including series production readiness
LCC, CBA & Business Case			CBA update alongside PioDAC return of experience	
FUNDING INSTRUMENTS & POLICIES		**Pioneer Train funding ensured**		DAC funding programme to be sustainably anchored in EC Work Programme, EU 2028-34 and member states' budgets

Together, we can make DAC happen!

100+ organisations and 300+ participants in EDDP
only EDDP PB and SB members are listed here

SEESARI South East Europe Strategic Alliance for Rail Innovation
UIRR Union Internationale pour le Transport Combiné Rail-Route
ERFA European Rail Freight Association
LTG Lietuvos Geležinkeliai
European Commission
AERRL
PKP CARGO
ermewa
unife The European Rail Industry
EUROPEAN UNION AGENCY FOR RAILWAYS
RAILFREIGHT FORWARD European Rail Freight Vision 2030
GATX
CER The Voice of European Railways
LINEAS
VTG
European Rail Infrastructure Managers EIM
TRANSWAGGON TWA
UIC

DELLNER
SBB CFF FFS Cargo
adif renfe
ceit Member of Basque Research & Technology Alliance
KNORR-BREMSE
FRET SNCF
DLR
Hitachi Rail STS
DB Cargo
Wabtec Corporation
Mercitalia Intermodal Gruppo Ferrovie dello Stato Italiane
indra
Talgo Technology
VOITH
ÖBB
Jernbane-direktoratet
ProRail
SIEMENS
TX Cargo
THALES
ALSTOM
TRAFIKVERKET
voestalpine ONE STEP AHEAD.

EU-Rail FP5 partners
only the beneficiaries are mentioned here

Q & A

Closing Words by the EU-Rail Executive Director

Giorgio Travaini

Europe's Rail Members

acciona
adif
ALSTOM
MERMEC
AN ANGEL COMPANY
CAF
ceit
MEMBER OF BASQUE RESEARCH & TECHNOLOGY ALLIANCE
DB
DLR
ESGR
European Smart Green Rail
Faiveley Transport
A Wabtec Company
FERROVIE DELLO STATO ITALIANE
FREQUENTIS
FOR A SAFER WORLD
HITACHI
Inspire the Next
indra
Talgo
Infraestruturas de Portugal
Jernbane-direktoratet
KNORR-BREMSE
kontron
The Power of IoT
ÖBB
PKP
ProRail
SIEMENS
XLAB
SNCF
Strukton
Rail
TRAFIKVERKET
RAILWAY SYSTEMS
by voestalpine
Slovenske železnice
VIAS

Thank you

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